

Final Report

PART I: BIOLOGICAL ANALYSES OF  
BOTTOM SAMPLES--  
TEXAS SUBMERGED LANDS

by

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# Benthic Biology of the Galveston-Houston Area

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Faunal assemblages  
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Total species (live)  
Total numbers of individuals of all species  
Polychaete species  
Molluscan species (live and dead)  
Molluscan species (live)  
Crustacean species  
Polychaete individuals  
Molluscan individuals (live)  
Crustacean individuals  
Total organic carbon

## INTRODUCTION

In March 1976, the Bureau of Economic Geology began an extensive program to sample the submerged lands of Texas. Using precise radionavigation techniques, benthic samples were taken on a 1-mi interval from rivers to 10.36 statute mi (3 leagues) offshore. By January 1978, 6,697 samples had been collected.

Sample analysis included textural studies, geochemical (trace element, organic carbon, uranium equivalent) determinations, bathymetry, geophysical data, and biologic studies.

This report on the biology of the Galveston-Houston area will provide preliminary information on benthic macroinvertebrate distribution and diversity. Further analyses would provide a more extensive biological data base to help assess and predict the problems and potential impact of development on State submerged lands.

## PHYSICAL SETTING

The Galveston Bay complex is the largest bay-estuarine system on the Texas coast. This complex consists of Galveston, Trinity, East, West, Chocolate, Bastrop, and Christmas Bays. The entire complex has an area of 610 mi<sup>2</sup> (Lankford, 1969) and is separated from the Gulf of Mexico by Galveston Island and Bolivar Peninsula. This barrier system is breached by three tidal passes or inlets, Rollover Pass, Bolivar Roads, and San Luis Pass. These passes provide only limited hydrologic communication between the Galveston Bay complex and the open Gulf of Mexico.



The Trinity River, which flows into Trinity Bay, is the major river in the area. The San Jacinto River, which flows into the northwest part of Galveston Bay, is of minor importance. The Trinity ranks first in average annual discharge when compared to other Texas rivers (Lankford, 1969).

The drainage basin of the Trinity and San Jacinto Rivers is in the moist subhumid climatic zone (Thorntwaite, 1948). Average annual precipitation for the Galveston area ranges from 46 inches in the southern region of West Bay to 51 inches in the Trinity Delta area (Texas Parks and Wildlife, 1975).

The mean astronomical tidal range in the Galveston Bay area is about 1 ft. The prevailing south and southeast winds may raise the bay level 2 to 3 ft (Lankford, 1969). Strong northerly winds may lower the water level considerably.

### Salinity

Salinity data were not collected in the Galveston Bay system and offshore during the sampling period in 1976 and 1977. Surface salinities from National Oceanic and Atmospheric Administration data and the Texas Department of Water Resources and salinities from Texas Parks and Wildlife data (1967, 1968, 1971, 1975) can be used to help make some generalizations about the salinities in the different bays.

The Texas Department of Water Resources (1979) generated a mathematical model for salinities in the Galveston Bay system based on salinities collected during four days in July and average monthly inflows of freshwater from 1941-1976.

Two distinct salinity patterns occur; one during the months of March, April, May, and June and the other during the remainder of the year. Salinities in Trinity Bay never got above 5 ‰ during the months of March through June. Maximum salinities of 15 ‰ in Trinity Bay occurred during August. Galveston Bay salinities during March, April, May, and June ranged from 5‰ in its upper part to 25‰ near Bolivar Roads. Salinities during the other eight months in Galveston ranged from 10‰ to 30‰ near

Bolivar Roads. West Bay salinities are uniformly high from 20 to 25‰. East Bay salinities in March, April, May, and June range from 10 to 15‰. Salinities of about 25‰ occur in February near the boundary between Galveston and East Bay.

Monthly surface salinity data taken by Texas Parks and Wildlife were available for the years 1967, 1968, 1971, and 1975. Average monthly salinities in West Bay were almost always above 20‰. Salinities in Trinity Bay averaged from 19.2‰ in 1971 to 2.1‰ in 1975. Average yearly salinities in East Bay were similar to those in Galveston Bay for the four years. Salinities ranged from an average of 8.7‰ in 1975 to 23.3‰ in 1971. In Galveston Bay salinities ranged from 13.5‰ in 1975 to 23‰ in 1967. Salinities were lowest in the months of April, May, and June and highest in July, August, October, and November.

In West Bay salinities were consistently highest near San Luis Pass and the causeway connecting Galveston Island to the mainland. Salinities at stations in the Bolivar Roads area of Galveston Bay averaged from 15 to 25‰ in upper Galveston Bay to 30‰ near Bolivar Roads. Rollover Pass probably has only a limited effect on East Bay as salinities at Parks and Wildlife stations near the pass were sometimes near 5‰ and only during the summer of 1971 did salinities get above 25‰. Upper Trinity Bay salinities often did not get above 10‰.

#### Sediment

A revised sediment map, using four sediment gradients, was plotted. Sediments were classified by percent sand as 0 to 20 percent, 20 to 50 percent, 50 to 80 percent, and 80 to 100 percent sand. This map was created by combining visual data from the field during sampling, and laboratory analysis of selected stations. It was deemed necessary to create this map when obvious discrepancies were found in the sediment map plotted totally from laboratory data.

## Bays

Substrate in the Galveston Bay system is predominantly less than 20 percent sand. Areas with greater than 50 percent sand are confined to the bay margins. The deeper centers of Trinity, Galveston, and East Bays are almost entirely less than 20 percent sand. In West Bay, the predominant substrate differs on either side of Carancahua Reef. To the east of the reef, the substrate is mostly 20 to 50 percent sand with moderately large areas of 50 to 80 percent sand. West of Carancahua Reef, the substrate contains less sand, with most sediments in a range of 0 to 50 percent sand.

Areas of sediment input concentrate substrates of high percent sand. At the tidal inlets, Bolivar Pass and San Luis Pass, the substrates are predominantly greater than 50 percent sand. The mouth of the Trinity River at the north end of Trinity Bay is another relatively large area of sandy sediments.

Both Bastrop and Christmas Bays are primarily composed of less than 50 percent sand.

## Inner Shelf

The substrate on the Gulf inner continental shelf is partitioned bathymetrically between sediments of greater than and less than 80 percent sand. Southwest of the Bolivar Roads inlet, the nearshore sediments at depths shallower than 24 to 30 ft are almost entirely 80 to 100 percent sand. Northeast of Bolivar Roads this high sand area narrows to a zone from the shoreline to just beyond 6 ft of depth. Wider expanses of sandier substrates occur at the Bolivar Roads and San Luis Pass tidal inlets.

Beyond the sandy nearshore zone, the shelf substrate is predominantly less than 50 percent sand. Of the shelf stations sampled, 75.2 percent had substrates in the 0 to

50 percent sand range, these stations being evenly represented by 0 to 20 percent and 20 to 50 percent sand ranges. Scattered patches of 50 to 80 percent sand substrates occur throughout the deeper offshore shelf.

## Bathymetry

### Inner Shelf

The 673 samples taken on the Gulf inner continental shelf range in depth from less than 20 ft (1 mi offshore) to greater than 60 ft (10 mi offshore). Nearshore depth increases to 24 ft within 1 to 2 mi offshore. From 2 to 10 mi offshore, the inner continental shelf dips gently at an average of 4.4 ft/mi. The Gulf attains greater depth at the southwestern end of the Galveston-Houston sheet area, where the depth is more than 60 ft at 10 mi offshore. At the northeastern end of this area, the Gulf is only 42 to 48 ft deep at 10 mi offshore. Bathymetric profiles at the mouth of the Bolivar Roads inlet are probably not reliable, due to dumping of dredged material in this area.

Gulf bathymetry and substrate-relations are shown on the percent sand map. Figure 1 indicates the percentage of the total and examined stations at various depth ranges. Substrates of less than 50 percent sand predominate at depths greater than 24 ft. Substrates with 80 to 100 percent sand predominate in only the shallowest depths on the shelf. Areas of high percent sand reach greater depths at the mouths of the tidal inlets (Bolivar Roads and the San Luis Pass), where sediment input occurs.

It is apparent, from figure 1, that the 18-24 foot depth range is overrepresented in the group of examined stations. Stations in the ranges of 24 to 30 ft and 30 to 42 ft deep are underrepresented.

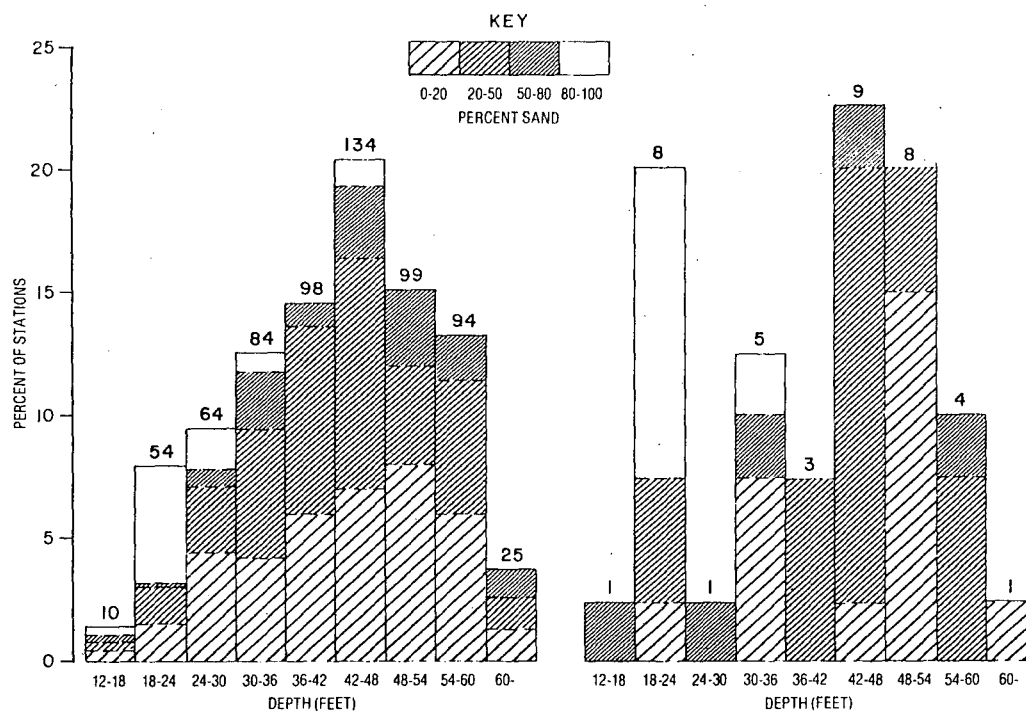


Figure 1. Comparison by sediment type of the total stations (left histogram) and examined stations at various depth ranges.

## Bays

The 705 samples taken in the Galveston Bay system range in depth from less than 2 ft to approximately 12 ft. The maximum depth in Trinity Bay is about 10 ft, in an area just south of Houston Point. Galveston Bay reaches a depth of about 10 to 12 ft along the Houston Ship Channel from Morgan Point south to Bolivar Roads. Maximum depth in East Bay is about 8 ft. This area in East Bay is adjacent to Hanna Reef, which forms a natural barrier between East Bay and Galveston Bay. West Bay reaches a maximum depth of 6 ft in the bay center on either side of Carancahua Reef. Bastrop and Christmas Bays reach a maximum depth of 2 ft.

The bays generally reach maximum depth within the first 3 mi from shore. The depth gradient is more gentle at areas of high sediment input, such as northeastern Trinity Bay, where the Trinity River dumps its sediment load. The near-shore areas of the bay system have substrate predominantly greater than 50 percent sand. Towards the deeper bay centers, the sand content of the substrate decreases. Most of the central bay area has substrates of less than 20 percent sand.

## Total Organic Carbon

Total organic carbon (TOC) ranged from less than 0.4 to greater than 2.4 percent. The lower values of TOC tend to correspond to sediments of 50 to 100 percent sand and are generally distributed along shallow bay margins and nearshore in the Gulf. The higher values of TOC tend to correspond to sediments of 0 to 50 percent sand and are usually found in deep bay centers and farther offshore in the Gulf.

In the bays the higher values of TOC are concentrated in Upper Galveston Bay, Trinity Bay, and East Galveston Bay. Values in these bays generally ranged from 1.2 to slightly less than 2.4 percent with one station in Trinity Bay (432) with over 4.0 percent.

In Galveston Bay values of TOC were less than 1.2 percent with most values less than 0.8 percent except at stations D, 28, 39 and those in Galveston Channel and those stations bordering East Galveston Bay.

In West Bay values of TOC were generally less than 0.8 percent with a few stations approaching 1.2 percent and three stations, 66, 82, and 88 with values about 1.6 percent.

Total organic carbon in the Gulf generally increased in a seaward direction although the major portion of the stations had values of less than 1.2 percent with most less than 0.8 percent. Only small, patchy areas south of Bolivar Roads had values approaching 2.0 percent with one station (3001) having a value more than 2.0 percent.

### Geochemistry

Semiquantitative spectrographic analysis for heavy metals and trace elements was made of random samples from bay bottoms of Galveston, Trinity, East, and West Bays. Procedures and methods of analyzation can be found in the geological section of this report.

Higher concentrations of trace elements and heavy metals generally coincide with deep areas of water bodies, areas of mud, and areas of total organic carbon. The following four heavy metals were selected as representatives to show distribution (table 1) and possible influence on benthic invertebrate systems.

#### Chromium

Bay sediments contained chromium in a range of 5.5 to 71 ppm. Distribution followed the previously mentioned trends. High concentrations (greater than 50 ppm) occurred at stations 195, 198, 211, 222, 231, 288, 352, 358, and 391 in the Galveston Bay complex and stations 60 and 97 in the West Bay system.

Station #	Sediment Type (%)	Cr	Cu	Pb	Zn	# of Species	# of Individuals	H'
1	20 - 50	14	6.8	11	22	5	33	1.285
7	0 - 20	23	8.1	≤10	29	7	7	1.475
9	20 - 50	21	16	≤15	45	14	18	2.253
16	50 - 80	≤30	5-10	≤15	≤25	7	5	1.906
18	20 - 50	≤30	5-10	≤15	25-35	3	22	.576
21	80-100	5.5	3.5	≤10	22	7	13	1.561
34	80-100	≤30	5	≤15	35-45	7	22	1.286
42	0 - 20	63	19	28	43	4	5	1.242
44	20 - 50	≤30	5	≤15	0-25	17	33	2.556
54	80-100	27	4.2	≤10	22	2	2	1.099
63	80-100	33	5-10	≤15	0-25	2	2	.693
70	20 - 50	24	12	17	82	11	14	2.305
75	50 - 80	≤30	5	≤15	22	6	14	1.569
77	50 - 80	≤30	10-15	15-25	22	3	4	1.04
111	0 - 20	41	17	19	24	5	8	1.494
118	50 - 80	≤30	5	15	22	7	24	1.676
119	50 - 80	40-50	5-10	15	35-45	4	31	.887
137	50 - 80	42	≤10	13	22	8	18	1.663
142	20 - 50	≤15	19	47	220	6	16	1.542
151	0 - 20	40-50	10-15	15-25	35-45	3	5	.95
161	0 - 20	50-60	15-20	15-25	55-65	3	3	1.099
181	50 - 80	40-50	15-20	15	25-35	7	27	1.571
195	50 - 80	50-60	10-15	15-25	65-75	12	62	1.98
198	0 - 20	56	21	37	79	3	3	1.099
209	50 - 80	40-50	10-15	15-25	45-55	9	19	1.889
211	0 - 20	66	20-25	28	37	3	11	.94
222	0 - 20	50-60	5-10	15-25	25-35	12	32	2.146
231	20 - 50	71	19	33	54	1	1	0.0
238	20 - 50	40-50	15-20	15-25	35-45	1	9	1.149
279	80-100	6.2	5	≤40	22	2	3	.562
281	20 - 50	30-40	15-20	26-35	25-35	2	2	0.0
283	0 - 20	40-50	15-20	26-35	45-55	6	12	1.748
288	0 - 20	≤60	20-25	26-35	55-65	3	21	.594
294	80-100	≤30	5	≤15	22	2	2	.693
303	0 - 20	40-50	20-25	26-35	55-65	6	7	1.748
311	80-100	34	6.1	14	22	4	80	1.042

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Table 1. (cont)

Station #	Sediment Type (%)	Cr	Cu	Pb	Zn	# of species	# of individuals	H'
326	50 - 80	40-50	10-15	26-35	25-35	3	6	.693
327	80 -100	6.5	5-10	34	22	3	3	.950
352	80 -100	50-60	10-15	26-35	55-65	1	2	0.0
358	0 - 20	50-60	15-20	43	45-55	1	13	.536
370	80 -100	40-50	10-15	≤15	22	3	3	1.099
391	0 - 20	50-60	10-15	15-25	35-45	1	1	0.0
416	80 -100	≤30	5	≤15	22	4	2	1.277
425	0 - 20	30-40	10-15	≤15	22	3	4	1.04
427	20 - 50	30-40	5-10	≤15	22	4	15	1.488
448	20 - 50	24	12	14	22	2	3	.637
459	0 - 20	35	7.8	14	22	1	4	0.0

## West Galveston Bay Heavy Metal Concentrations (ppt)

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Station #	Sediment Type (%)	Cr	Cu	Pb	Zn	# of Species	# of Individuals	H'
5	20 - 50	30- 40	10- 15	≤15	25- 35	10	33	1.805
6	0 - 20	47	18	22	28	10	203	.921
15	20 - 50	≤30	5- 10	≤15	25- 35	31	159	2.561
18	80 -100	40- 50	10- 15	≤15	22	17	94	1.922
21	50 - 80	≤30	10- 15	≤15	35- 45	19	123	1.851
25	80 -100	40-50	5-10	≤15	22	23	192	2.25
28	20 -100	40-50	10-15	≤15	25-35	14	91	1.297
30	80 -100	≤30	5-10	≤15	44-55	10	24	1.893
44	80 -100	40-50	10-15	≤15	22	4	12	.898
46	20 - 50	40-50	10-15	≤15	35-45	19	179	1.857
48	80 -100	30-40	5-10	≤15	45-55	17	197	1.541
52	80 -100	≤30	≤5	≤15	22	6	21	1.234
55	80 -100	40-50	10-15	≤15	25-35	11	117	1.58
59	80 -100	40-50	5-10	≤15	22	16	69	2.519
60	0 - 20	50-60	5-10	15-25	22	8	40	.967
93	20 - 50	23	8.3	12	22	22	83	2.622
97	50 - 80	50-60	5-10	≤15	22	12	27	2.008
101	80 -100	≤60	0- 5	≤15	22	8	99	.761

## Copper

Copper has a distribution similar to chromium. Low concentrations (less than 10 ppm) of copper occurred in all sediments. Average concentrations were in a range of 15 to 20 ppm, with a low of less than 5 ppm and high of 20 to 25 ppm being recorded. Areas of high copper concentration (20 to 25 ppm) in Galveston Bay included stations 211, 288, and 303. There were no stations in West Bay higher than 18 ppm concentration.

## Lead

Concentrations of Pb in bay sediment of Galveston Bay ranged from less than 10 to 47 ppm. Highest accumulations were at stations 42, 142, 198, 211, 231, 279, 281, 283, 288, 303, 326, 352, and 358. These are predominantly mud areas and also high in organic carbon content. Low concentrations of lead occurred in all ranges of sediments. West Bay had a range of 12 to 25 ppm. The highest concentrations (15 to 25 ppm) were found at stations 60 and 111. Most stations in West Galveston Bay contained less than 15 ppm Pb.

## Zinc

Highest concentrations of Zn occurred in Galveston Bay. Station 142 contained 220 ppm. The lowest range was less than 22 ppm. Other stations recording high Zn levels included stations 70 and 198. All sediment types contained low concentrations. Low levels of Zn were consistently noted in West Galveston Bay.

## FIELD PROCEDURES

### Inner Shelf

Surface sediment samples were collected on the Texas inner continental shelf with a Smith-McIntyre grab sampler, at sites determined by a grid, with samples spaced one mi apart. Penetration depths ranged from 4 to 16 cm. Shelf samples were collected in October 1976 and September 1977. Precision navigation was accomplished primarily with a Motorola Mini Ranger system, but shipboard radar and Loran C also were used.

Shipboard descriptions were based on visual observations of sediment type, sediment color, shell content, degree of bioturbation, abundance of worms, and preservation of individual sediment layers in a vertical sequence.

Sediments were: (1) washed through a .5-mm or 1-mm screen, (2) narcotized with a solution of propylene phenoxylol, (3) and stored in a neutral solution of 10 percent formalin. Rose bengal was placed in the formalin to help distinguish live from dead specimens.

### Bays

Sediment samples were taken at 1 mi intervals with a clam shell grab sampler with a capacity of .13 ft<sup>3</sup>. Enough grabs were taken at a station to equal approximately .13 ft<sup>3</sup>. The samples were semiquantitative as the volume was estimated visually.

Benthic samples were collected in Galveston, Trinity, and East Bays from July 15 to October 1, 1976. Samples 1-63 in West Bay were taken in January 1977, while other West Bay samples were collected in July 1976. Houston Ship Channel and Clear Lake samples were collected in August and September, 1976.

Shipboard processing was essentially the same as on the inner shelf except that samples were always washed through a 1-mm mesh screen and narcotized with magnesium sulfate.

#### LABORATORY PROCEDURES

Laboratory processing included further washing of the sample and storing it in 70 percent ethanol. All invertebrates were identified to species level when possible. Live specimens and whole shells were counted. Fragments of shells were counted only if identifiable characters, and at least 50 percent of the shell was preserved. Live and paired dead pelecypod valves were counted as 1; unpaired valves were counted as ½.

Total organic carbon content was determined by a wet-combustion technique (Jackson, 1958).

#### INVERTEBRATE DISTRIBUTIONS

Two hundred sixty-three species and 5,189 individuals were found living in the 130 samples examined in the Galveston area (table 2). The polychaetes had the highest total number of living species and individuals, followed by the mollusks and crustaceans. More species of all groups except the mollusks were living in the Gulf of Mexico than in the Galveston Bay system.

The crustaceans had the highest number of species in the bays while the polychaetes were highest in the Gulf. The polychaetes had the highest number of individuals in both the bays and the Gulf (table 2).

All but 5 stations in Trinity, East, and Galveston Bays had 10 or less live species. Total species counts in West Bay were the highest of all the bays. Station 15 in West Bay had the highest number of species of all bay stations.

Table 2. Total Faunal Counts.

	Mollusks	Crusta- ceans	Poly- chaetes	Other Phyla
Total Live Species Bay	48	66	49	9
Total Live Species Gulf	43	72	88	10
Total All Live Species	75	72	102	14
Grand total (species)	263			
Total Live Individuals Bay	1,081	750	1,195	42
Total Live Individuals Gulf	473	418	1,045	185
Total All Live Individuals	1,554	1,168	2,240	227
Grand total (Individuals)	5,189			
Total Dead Molluscan Species Bay	55			
Total Dead Molluscan Species Gulf	92			
Total All Dead Species	147			
Total Molluscan Species Live and Dead	175			
Total Dead Molluscan Individuals (Bays)	5,010			
Total Dead Molluscan Individuals Gulf	26,871			
Grand total Dead	31,881			

In the Gulf, stations with the highest number of live species occurred nearshore from Bolivar Roads south to mid-Galveston Island. Stations north of Bolivar Roads were generally higher in total species numbers than those south of Bolivar Roads.

Total numbers of individuals in Trinity, East, and Galveston Bays were generally low. West Bay stations were almost uniformly high in numbers of individuals.

Nearshore Gulf stations from San Luis Pass north to near Bolivar Roads were highest in numbers of individuals. Generally, inshore areas had more individuals than extreme offshore areas.

Distributions of the polychaetes, mollusks, crustacea, and other phyla will be discussed individually, and their distribution related to salinity, total organic carbon, geochemistry, bathymetry, and sediment.

The invertebrate species collected and their distribution by station can be found in the Appendix.

#### Polychaeta

A total of 102 polychaete species and 2,240 individuals were found in the 130 samples from the Galveston area. Forty-nine species were found in the bays and eighty-eight in the Gulf. Nine polychaete families occurred only in the Gulf and four only in the bays and not the Gulf (table 3). Paraprionospio pinnata was the most abundant polychaete species, occurring in the Gulf and in all bays except Trinity. Polychaete distribution within each bay in the Galveston system and in the Gulf will be discussed.

Table 3.

Polychaete Families Found in Gulf of Mexico Only		Polychaete Families in Galveston Bay System Only	
1.	Nephtyidae	1.	Serpulidae
2.	Opheliidae	2.	Syllidae
3.	Pectinariidae	3.	Chaetopteridae
4.	Terebellidae	4.	Arabellidae
5.	Trichobranchidae		
6.	Sigalionidae		
7.	Palmyridae		
8.	Eulephtidae		
9.	Trochochaetidae		

## Bays

### Trinity Bay

Sixteen stations were examined for polychaetes in Trinity Bay. Trinity Bay had the lowest number of species (7) and individuals (87) within the Galveston Bay system. Trinity Bay averaged only 5 individuals and 1.9 species per station. Four of the 16 stations examined had no polychaetes.

Mediomastus californiensis was the dominant species, with 67 percent of the total number of polychaete individuals (table 4). However, M. californiensis occurred most often at bay center stations near Galveston Bay. M. californiensis did not occur in upper Trinity Bay. Parandalia fauveli and Nereis succinea were the only species occurring in upper Trinity Bay.

Ten of the 16 stations examined had 0 to 50 percent sand. M. californiensis was predominantly found in the 0 to 20 percent sands (fig. 2). Stations 288 and 358, both 0 to 20 percent sand stations, had 63 percent of the polychaete individuals.

### East Bay

Twelve stations were examined for polychaetes in East Bay. East Bay had 18 polychaete species and 109 individuals per station was 3.2 and 9.0, respectively. Stations 118, 119, and 222 had more than 50 percent of the total number of polychaete individuals.

Paraprionospio pinnata was the most abundant species with 23 percent of the total number of individuals (table 4). Parandalia fauveli occurred at more stations (9 of 12) than any polychaete species in East Bay. P. fauveli occurred from near Rollover Pass to near Galveston Bay. Figure 3 shows the distribution by sediment type of the three most abundant polychaete species in East Bay.



Table 4. Dominant Polychaete Species  
(Number of Individuals and Percent of Total).

Species in Gulf	Number of Individuals	Percent of Total Number (1128) of Polychaetes in Gulf
<u>Paraprionospio pinnata</u>	149	13
<u>Magelona phyllisae</u>	119	11
<u>Chone</u> sp.	95	8
<u>Loimia medusa</u>	57	5
<u>Diopatra cuprea</u>	52	5
<u>Nereid (Nicon) sp. "A"</u>	50	4
<u>Armandia maculata</u>	34	3
<u>Cossura delta</u>	33	3
<u>Haploscoloplos foliosus</u>	32	3
<u>Lumbrineris tenuis</u>	29	3
<u>Ninoe nigripes</u>	26	2
<u>Sigambra tentaculata</u>	20	2
Totals	696	62

Species in Trinity Bay	Number of Individuals	Percent of Total Number (46) of Polychaetes in Trinity Bay
<u>Mediomastus californiensis</u>	31	67
<u>Parandalia fauveli</u>	5	11
Totals	36	78

Species in East Bay	Number of Individuals	Percent of Total Number (109) of Polychaetes in East Bay
<u>Paraprionospio pinnata</u>	25	23
<u>Parandalia fauveli</u>	20	18
<u>Mediomastus californiensis</u>	15	14
Totals	60	55

Galveston Bay	Number of Individuals	Percent of Total Number (252) of Polychaetes in Galveston Bay
<u>Mediomastus californiensis</u>	72	29
<u>Streblospio benedicti</u>	40	16
<u>Nereis succinea</u>	31	12
Totals	143	57

West Bay	Number of Individuals	Percent of Total Number (747) of Polychaetes in West Bay
<u>Haploscoloplos fragilis</u>	112	15
<u>Mediomastus californiensis</u>	68	9
<u>Scoelelepis cf. texana</u>	66	9
<u>Clymenella torquata</u>	59	8
<u>Paraprionospio pinnata</u>	42	6
<u>Chone americana</u>	18	2
Totals	365	49

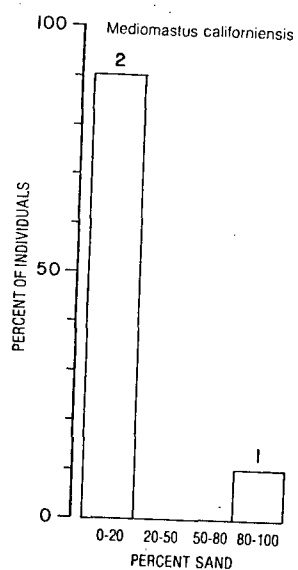


Figure 2. Distribution by sediment type of Mediomastus californiensis in Trinity Bay.

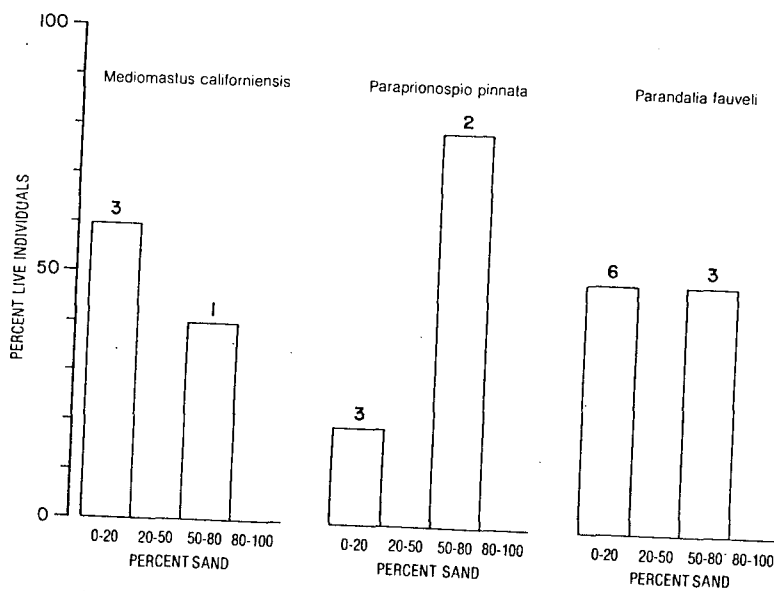


Figure 3. Distribution by sediment type of the three most abundant polychaetes in East Bay.

### Galveston Bay

Thirty species and 252 individuals were found in the 26 samples from Galveston Bay. The average numbers of species and individuals per station were 2.8 and 9.7, respectively. Four stations had no polychaetes. Station 311 in upper Galveston Bay had the most polychaete species with 70. Stations 9 and 142 had the most species with six.

Mediomastus californiensis was the most abundant polychaete in Galveston Bay with 70 individuals. M. californiensis was most abundant in bay margin sands in the 80 to 100 percent category (fig. 4). Streblospio benedicti and Nereis succinea were also abundant. Streblospio benedicti also occurred most often in bay margin sands while Nereis succinea was most abundant in the 50 to 80 percent category (fig. 4).

The only areas in Galveston Bay with more than five species was an area extending from West Bay to station 44 on the Houston Ship Channel and station 142 in mid-Galveston Bay.

### West Bay

For the purpose of this discussion, West Bay includes three other smaller bays, Chocolate, Bastrop, and Christmas Bays.

West Bay had the highest number of polychaete species, 47, and individuals, 747, of all bays in the Galveston Bay system. Forty-seven of the 49 species found in the bays occurred in West Bay, and 15 West Bay species also occurred in the Gulf. Only one polychaete species, Haploscoloplos fragilis, composed more than 10 percent of the population (table 4). Six species made up 49 percent of the total number of polychaetes in West Bay. West Bay had the highest number of suspension-feeding species of all bays. Hydroides sp., Owenia fusiformis, Potamilla reniformis, and Chone americana were the suspension feeders in West Bay. Fifty percent of the suspension feeders occurred in the 80 to 100 percent sand category.

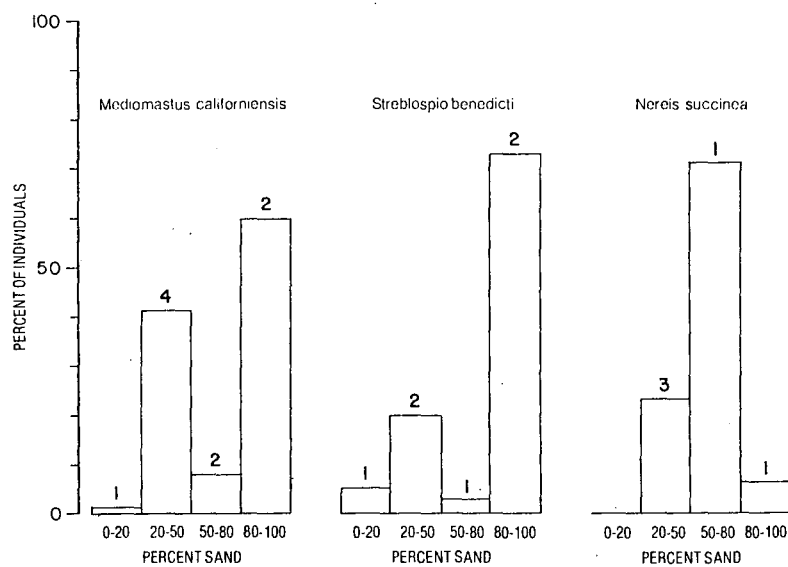


Figure 4. Distribution by sediment type of the abundant polychaete species in Galveston Bay.

Stations with the highest number of species, 17, and individuals, 162, were stations 15 and 48, respectively. Station 15 was in the 30 percent sand category and 17 had 80 to 100 percent sand.

The most abundant species, Haploscoloplos fragilis, occurred predominantly in the 80 to 100 percent sand category (fig. 5). Eighty-four percent of the total number of H. fragilis in West Bay occurred in the 80 to 100 percent category. Mediomastus californiensis and Clymenella torquata were most abundant in bay center muds of the 20 to 50 percent category (fig. 5).

Forty-six percent of the total number of polychaete individuals occurred in the 80 to 100 percent sands and 30 percent in the 20 to 50 percent sands.

Stations with the highest numbers of species were in northern West Bay from just south of Carancahua Reef to the causeway connecting Galveston Island to the mainland. Parts of Bastrop Bay and Christmas Bay were also high in species.

Isolated bay margin stations were high in numbers of individuals. Although West Bay had more stations with more than 15 individuals than any other bay in the Galveston system, most of the West Bay stations were low in numbers of individuals.

#### Inner Shelf

Eighty-eight polychaete species and 1,045 individuals occurred in the 40 benthic samples examined from the Gulf of Mexico.

Only two species, Paraprionospio pinnata and Magelona phyllisae, made up more than 10 percent of the total fauna and only six species were higher than three percent of the total. Magelona phyllisae and P. pinnata were the most ubiquitous species, occurring at 28 and 24 stations, respectively.

Two offshore areas were generally highest in numbers of species and individuals. They were (1) an area extending from San Luis Pass to 2 to 3 mi offshore and (2) an area 1 to 4 mi offshore from Galveston Island and extending from about 4 to 15 mi south of Bolivar Roads. Stations north of Bolivar Roads were generally low in both

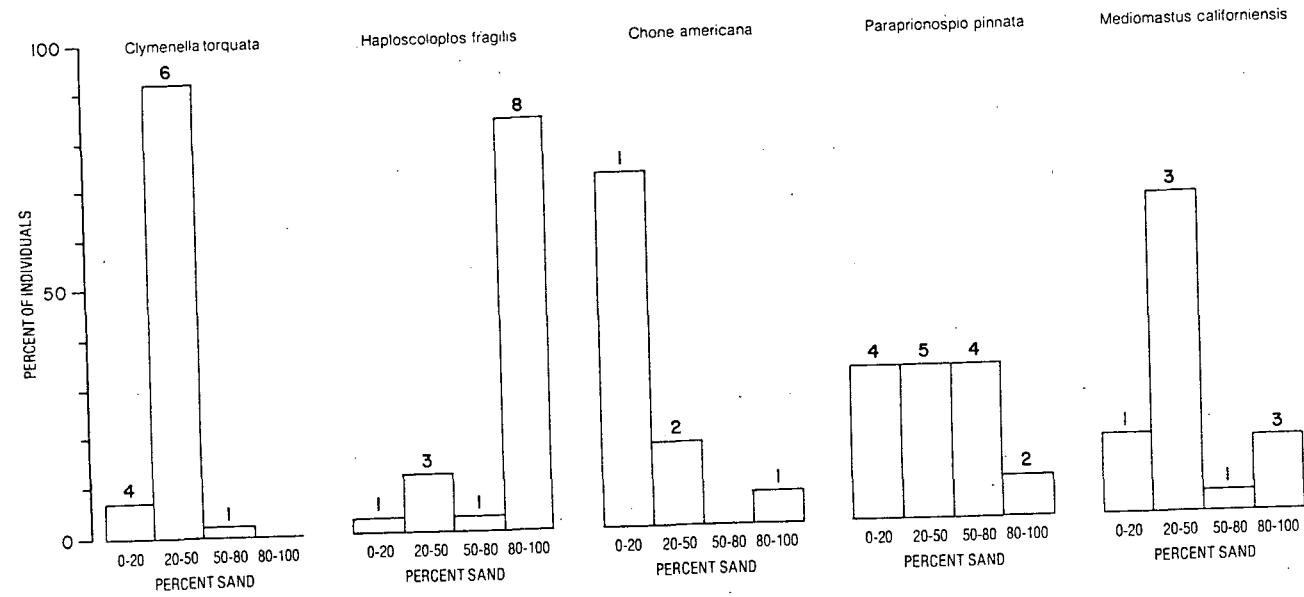


Figure 5. Distribution by sediment type of five abundant polychaete species in West Bay.

numbers of species and individuals. This second area contained the stations with the highest number of species, stations 3195 and 3285, both with 17 species.

Nearshore stations with sediment in the 50 to 100 percent sand category were highest in numbers of species and individuals. Stations with 80 to 100 percent sand averaged 48 individuals and 10.5 species per station, while stations with 0 to 20 percent sand averaged 14 individuals and 6 species per station. Stations with 50 to 80 percent sand averaged 11 species per station, the highest average of the 4-percent-sand categories.

Onuphis emerita and Chone sp. were both most abundant in the 80 to 100 percent sand category and in water depths of 18 to 24 ft (figs. 6 and 7). The most abundant species, Paraprionospio pinnata, occurred most often in the 50 to 80 percent sands and in water depths from 18 to 24 ft (fig. 8). Magelona phyllisae was most abundant in the muddier sediments of the 20 to 50 percent sand range and at depths ranging from 36 to 42 ft (fig. 9).

#### Mollusca

One hundred seventy-five species of mollusks were identified from the Galveston Bay area. Of these, there were 90 gastropod, 84 bivalve, and 1 scaphopod species. Thirty-seven gastropod and 38 bivalve species were collected live. The one scaphopod, Dentalium texasianum, was never collected live. The species collected and their distribution by station are listed in the Appendix.

In the bays and on the shelf the number of gastropod and bivalve species collected dead only were essentially the same. Live gastropod species were more numerous in the Gulf while live bivalve species were more numerous in the bays. Thirty-four dead and 12 live gastropod species were found on the shelf that did not occur in the bays while 10 dead and 4 living gastropod species were not found on the



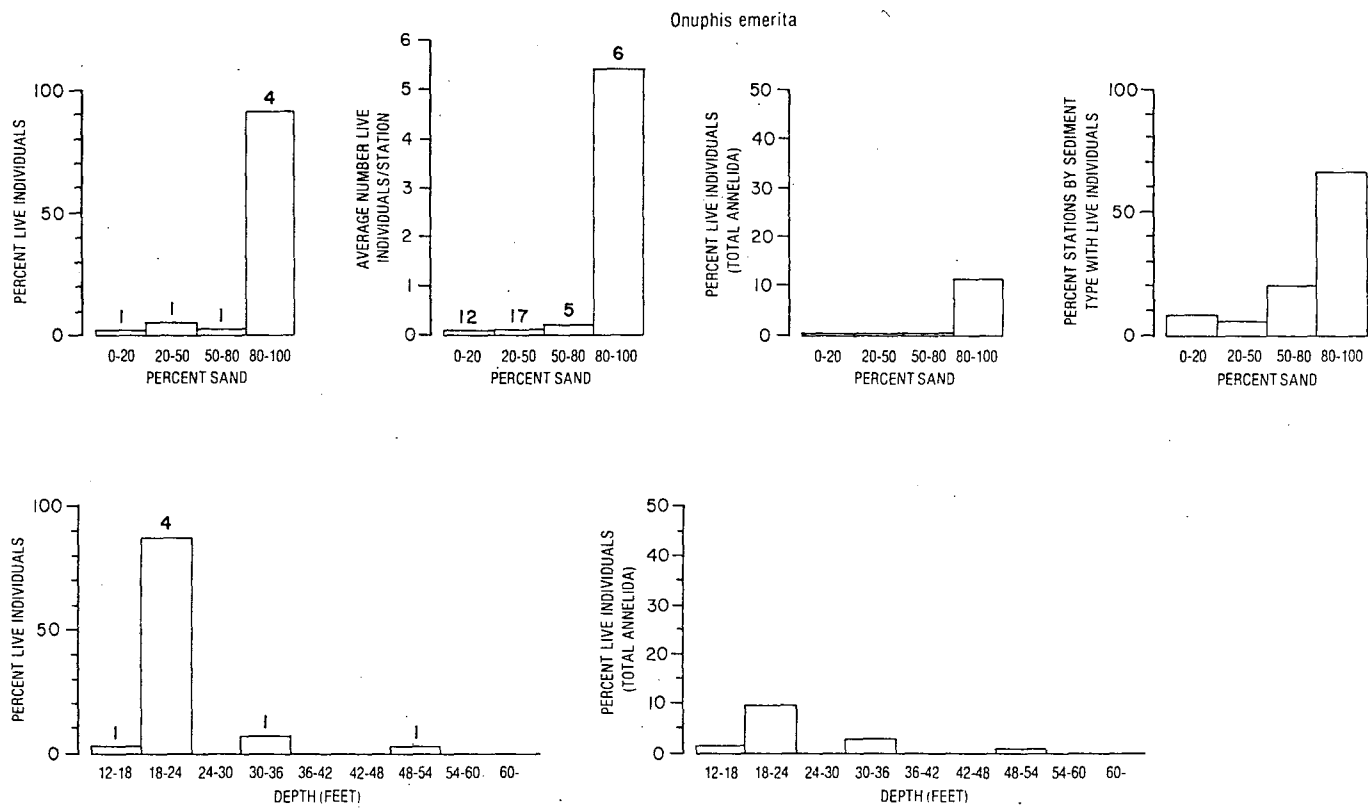


Figure 6. Distribution by sediment type and depth of *Onuphis emerita* in the Gulf of Mexico.

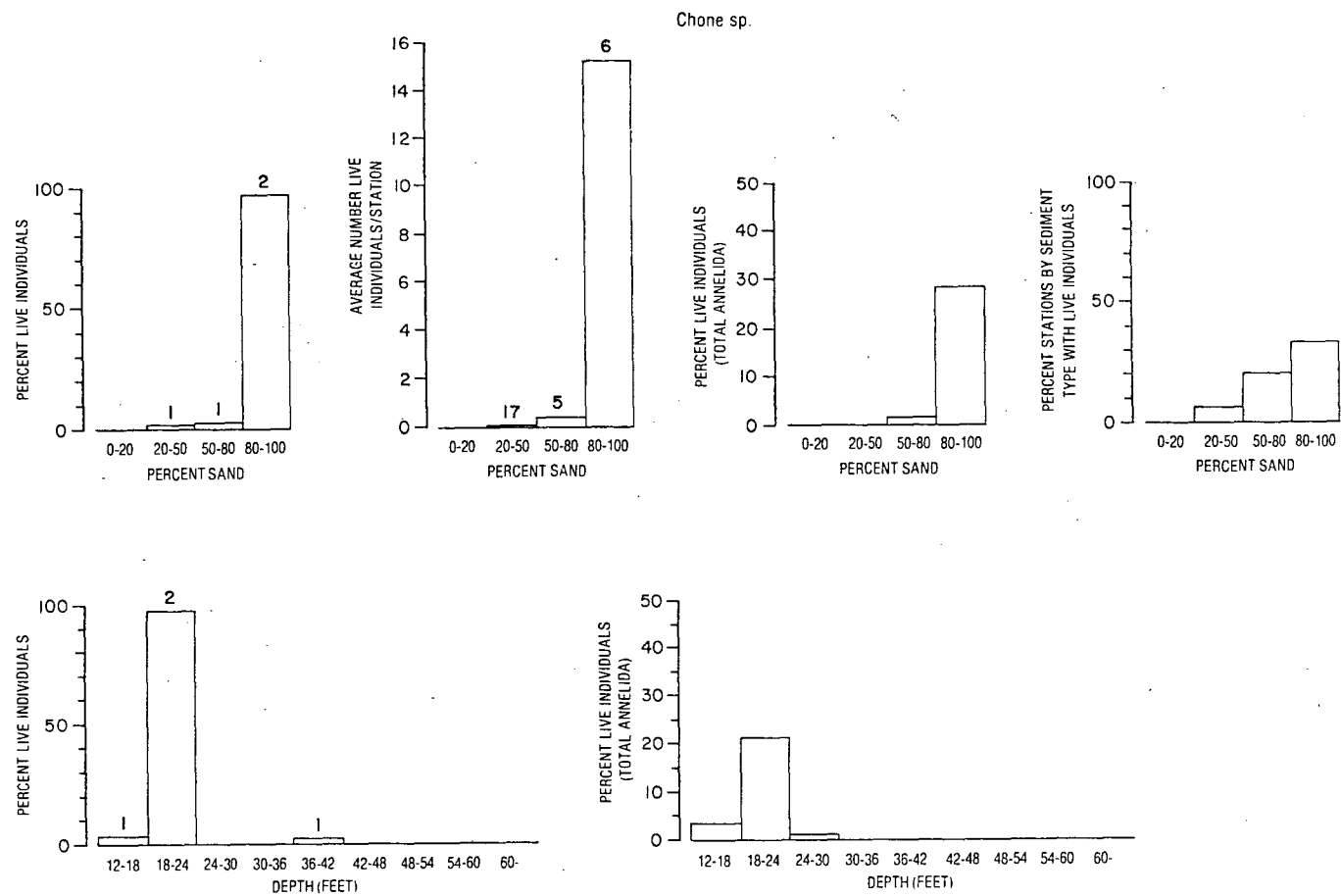


Figure 7. Distribution by sediment type and depth of Chone sp. in the Gulf of Mexico.

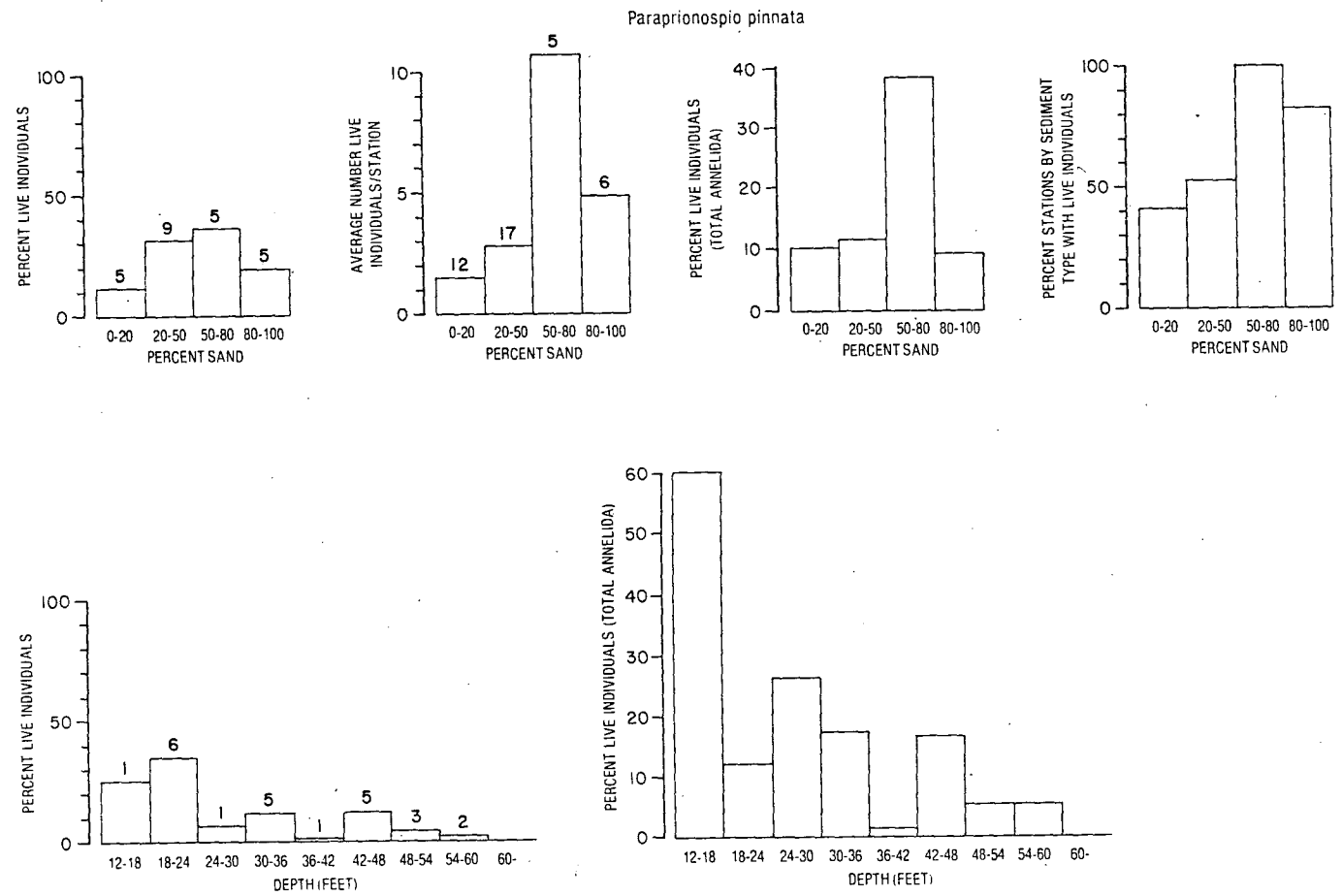


Figure 8. Distribution by sediment type and depth of *Paraprionospio pinnata* in the Gulf of Mexico.

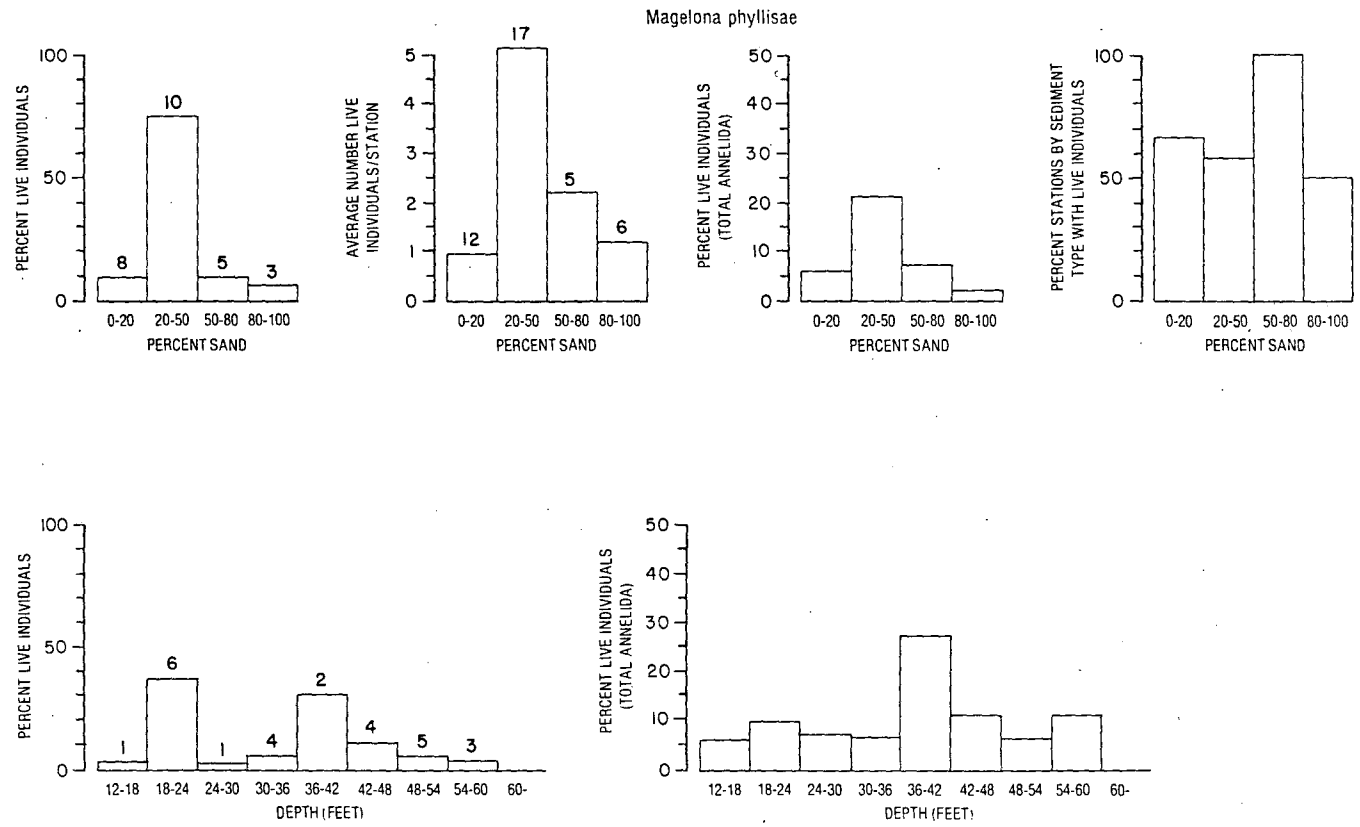


Figure 9. Distribution by sediment type and depth of *Magelona phyllisae* in the Gulf of Mexico.

shelf. Of the bivalve species 20 dead and 5 live found on the shelf did not occur in the bays while 10 dead and 11 living species from the bays were not found on the shelf (table 5 and 6). Data on distribution of selected live species by sediment type are presented in figures 10 and 11. The percent of total live individuals and live species of Mollusca from the shelf and the bays are compared in figures 12 and 13.

## Bays

### Galveston Bay

Ninety species of mollusks were identified from Galveston Bay. Of these, 39 species were gastropods, 50 were bivalves and 1 was the scaphopod, Dentalium texasianum. Only 9 of the gastropod species and 14 of the bivalve species were collected live. Of the 122 live individuals collected 22 were gastropods and 100 were bivalves. Distribution by sediment type of percent and average number of live individuals is presented in figures 14 and 15.

No gastropod could be considered dominant or indicative of environmental conditions in Galveston Bay, even if the live and dead material were combined. Additional samples would have to be examined before any true patterns of distribution could be discerned and any correlation made between distribution and sediment type or any other ecological or environmental parameters.

Mulinia lateralis was the most abundant bivalve in Galveston Bay occurring at 50 percent of the 26 stations. The distribution of live populations of Mulinia was essentially bay margin in sediments predominantly 80 percent to 100 percent sand. Mulinia was the only species of mollusk to occur in all bays as well as in the Gulf.

Petricola pholadiformes, while occurring live at only four stations, was second most numerous of the bivalves in Galveston Bay. It and Mulinia lateralis accounted for 51.1 percent of the total number of live individuals found in Galveston Bay. Three

Table 5. Molluscan Species Found Living in Bays Only.

	Species	Number			
		G	T	E	W
*1.	<u>Acteocina canaliculata</u>	2			69
2.	<u>Caecum pulchellum</u>				1
*3.	<u>Crepidula plana</u>	4			3
*4.	<u>Eulimastoma teres</u>				6
5.	<u>Eulimastoma sp.</u>				1
*6.	<u>Polinices duplicatus</u>	1			2
*7.	<u>Odostomia seminuda</u>				2
8.	<u>Odostomia impressa</u>				1
9.	<u>Texadina barretti</u>		5	7	6
10.	<u>Texadina spincostoma</u>	5	2		
*11.	<u>Vioscalba louisiana</u>		9		
*12.	<u>Mysella planulata</u>				59
*13.	<u>Lyonsia hyalina floridana</u>	1			195
*14.	<u>Mercenaria campechiensis</u>				1
15.	<u>Amygdalum papyria</u>	2			3
*16.	<u>Periploma margaritaceum</u>				46
17.	<u>Aligena texasiana</u>				42
*18.	<u>Corbula swiftiana</u>				1
19.	<u>Tellina texana</u>	2	1		1
20.	<u>Cumingia tellinoides</u>				2
*21.	<u>Paramya subovata</u>				1
22.	<u>Diplothyra smithii</u>	1			1
23.	<u>Laevicardium mortoni</u>	4			
*24.	<u>Tagelus divisus</u>				4
25.	<u>Chione cancellata</u>	1			1
26.	<u>Macoma mitchelli</u>	9	3	7	9
*27.	<u>Rangia flexuosa</u>		1		
28.	<u>Tellina iris</u>	6			
*29.	<u>Crassinella lunulata</u>	1			
30.	<u>Ischadium recurvum</u>	10			
31.	<u>Tagelus plebeius</u>	1			

G=Galveston

T=Trinity

E=East

W=West

\*Species found as dead shell in Gulf.

Table 6. Molluscan Species Found Living in Gulf and Not Bays.

- \*1. Vitrinella floridana
2. Cyclostremiscus pentagonus
3. Solariorbis infracarinata
4. Teinostoma biscaynense
- \*5. Epitonium apiculatum
6. Elima bilineatus
7. Kurtziella cerina
8. Kurtziella sp.
9. Terebra protexta
- \*10. Parvanachis ostreicola
11. Olivella dealbata
12. Olivella minuta
13. Volvulella persimilis
14. Volvulella texasiana
15. Pyramidella crenulata
- \*16. Odostomia gibbosa
17. Turbonilla portoricana
18. Turbonilla sp.
19. Natica pusilla
20. Anadara brasiliiana
- \*21. Anadara transversa
- \*22. Lunarca ovalis
- \*23. Parvilucina multilineata
24. Solen viridis
- \*25. Tellina versicolor
26. Macoma tenta
27. Corbula contracta

\*Species found as dead shell in bays.

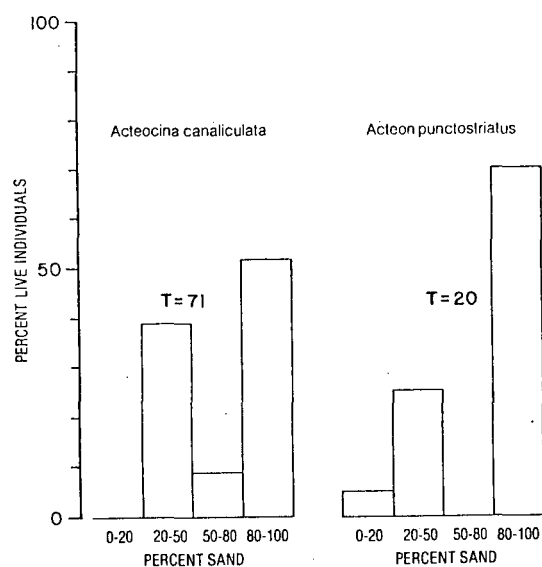


Figure 10. Distribution of selected bay gastropods by sediment type. T equals total number of live individuals.



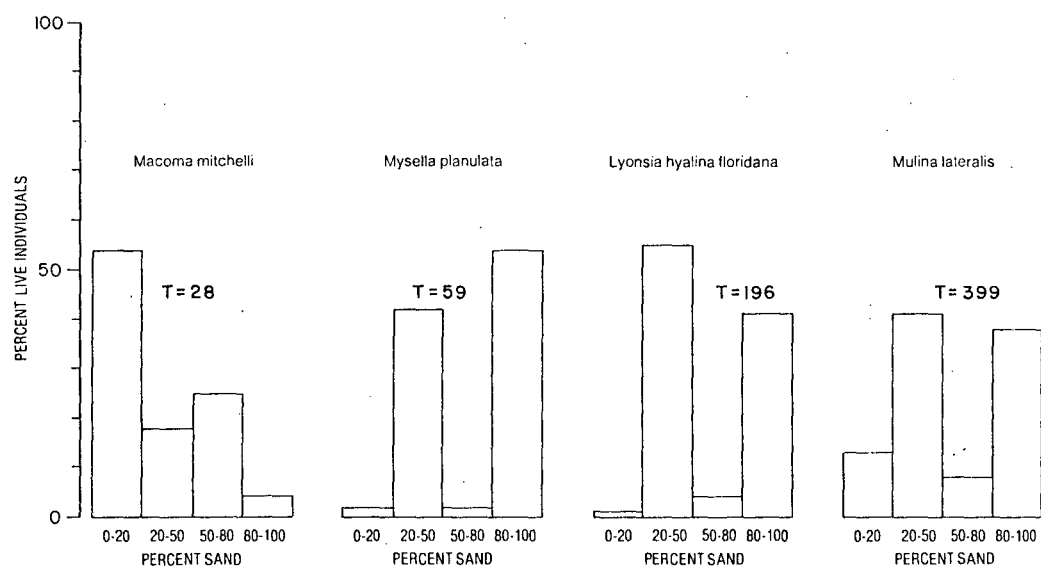


Figure 11. Distribution of selected bay bivalves by sediment type. T equals total number of individuals.

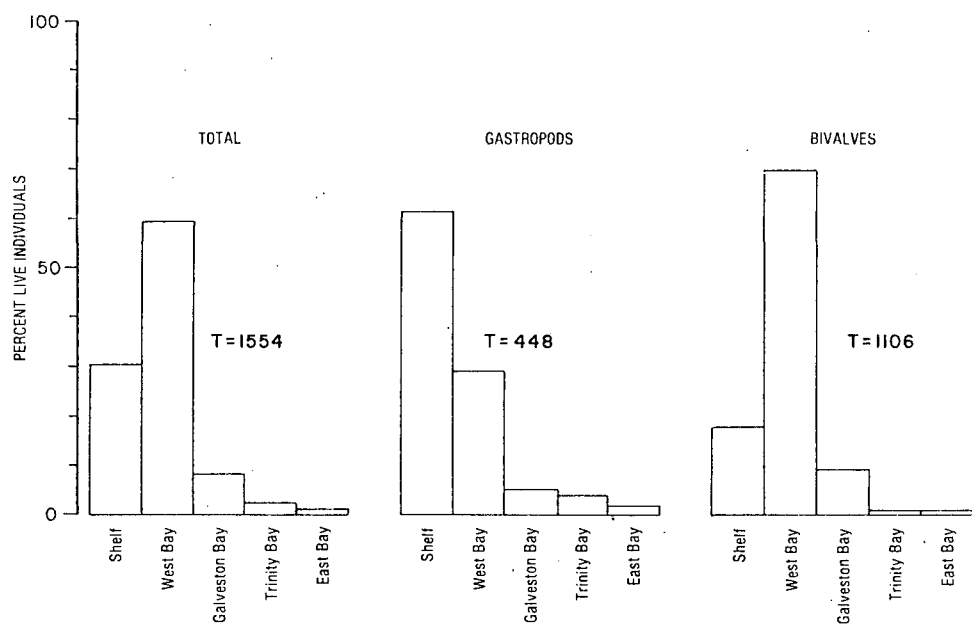


Figure 12. Comparison of the number of live individuals from the shelf and bay systems. T equals total number of individuals.

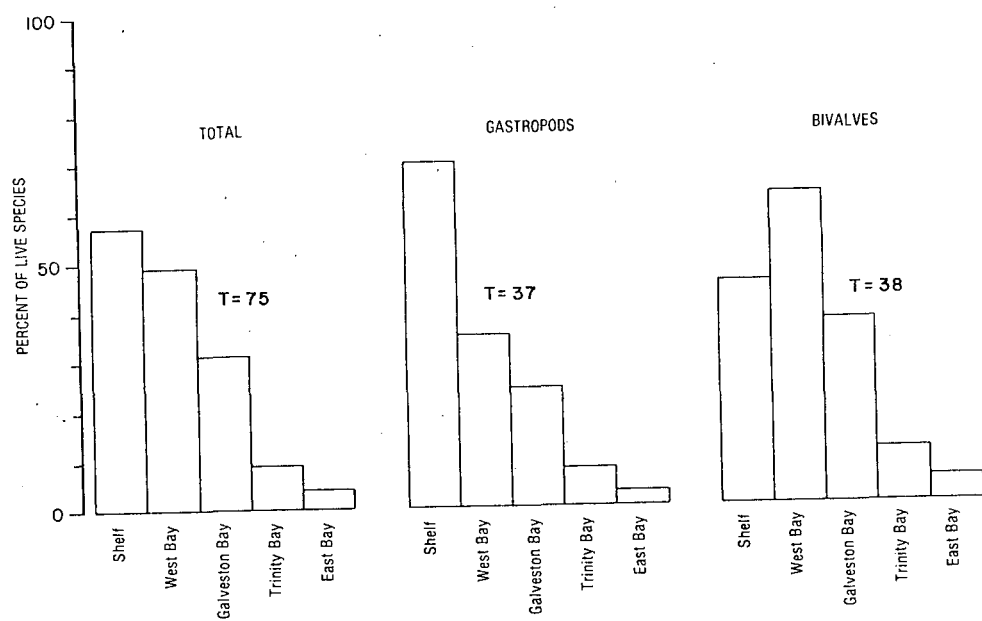


Figure 13. Comparison of the number of live species from the shelf and bay systems. T equals total number of species.

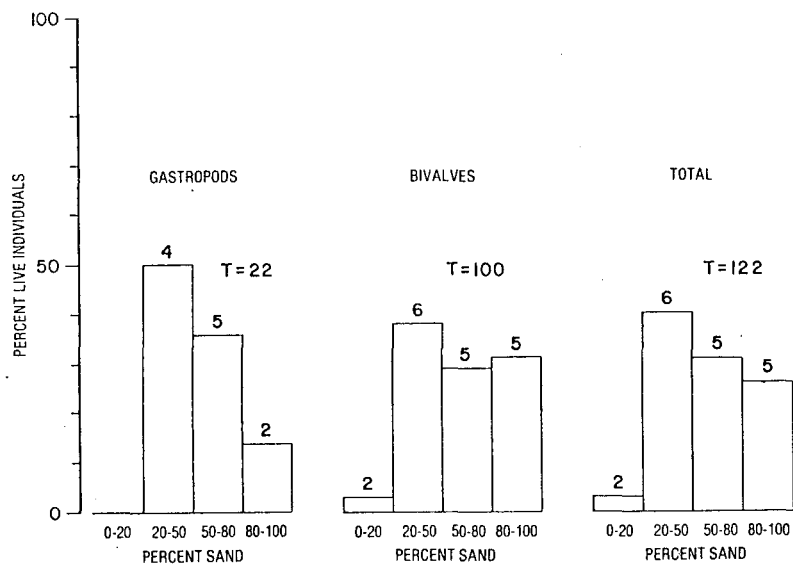


Figure 14. Distribution of percent live individuals from Galveston Bay by sediment type. Number of stations is shown above bar. T equals total number of individuals.

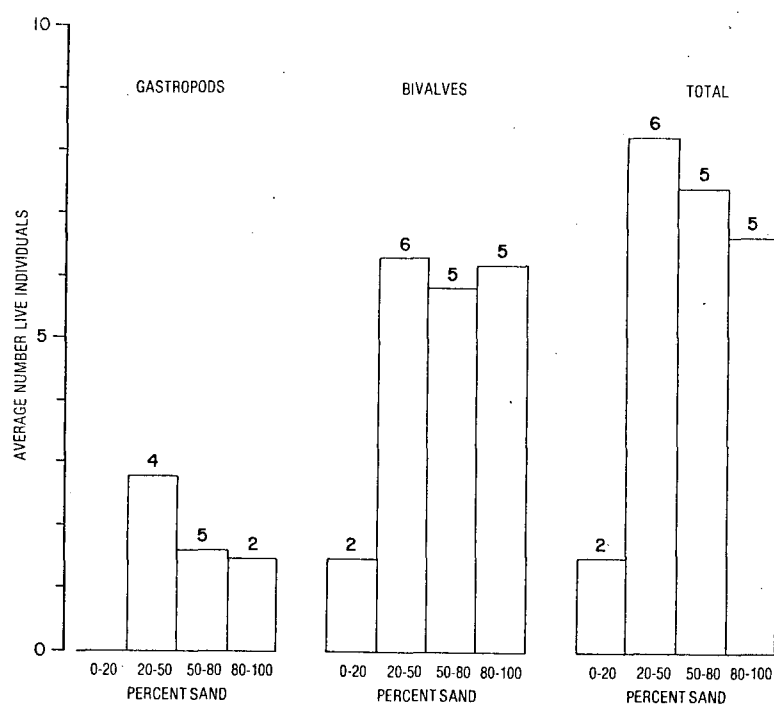


Figure 15. Distribution of average number of live individuals from Galveston Bay by sediment type. Number of stations is shown above bar.

of the stations at which Petricola occurred had a substrate of 20 percent to 50 percent sand, the other having an 80 percent to 100 percent sand substrate.

#### Trinity Bay

Only seven gastropod and nine bivalve species were collected in Trinity Bay. Three of the gastropod species, Texadina barretti, T. sphinctostoma, and Vioscalba louisianae, were collected live. These species are indicative of low-salinity to brackish-water conditions. The substrates in which these three species were found were predominantly 0 to 20 percent sand. Their distribution was essentially bay margin.

Mulinia lateralis was the most abundant bivalve species with Macoma mitchelli the second. As in all the bays except West Bay, Mulinia in Trinity Bay was essentially bay margin in distribution.

Distribution by sediment type of percent and average number of individuals is presented in figures 16 and 17.

#### East Galveston Bay

Eleven species of gastropods and eight species of bivalves were collected from East Galveston Bay. Only one species of gastropod, Texadina barretti, and two species of bivalves, Mulinia lateralis and Macoma mitchelli, were collected live. Each species had seven live individuals.

Texadina barretti occurred at only 1 station with a substrate of 0 to 20 percent sand. Mulinia lateralis occurred live at 4 of 12 stations and generally distributed in 50 to 80 percent and 80 to 100 percent sand substrate. Macoma mitchelli occurred live at 3 stations, the predominant substrate being 0 to 20 percent sand.

Distribution by sediment type of percent and average number of individuals for bivalves and total mollusks from East Bay is given in figures 18 and 19.

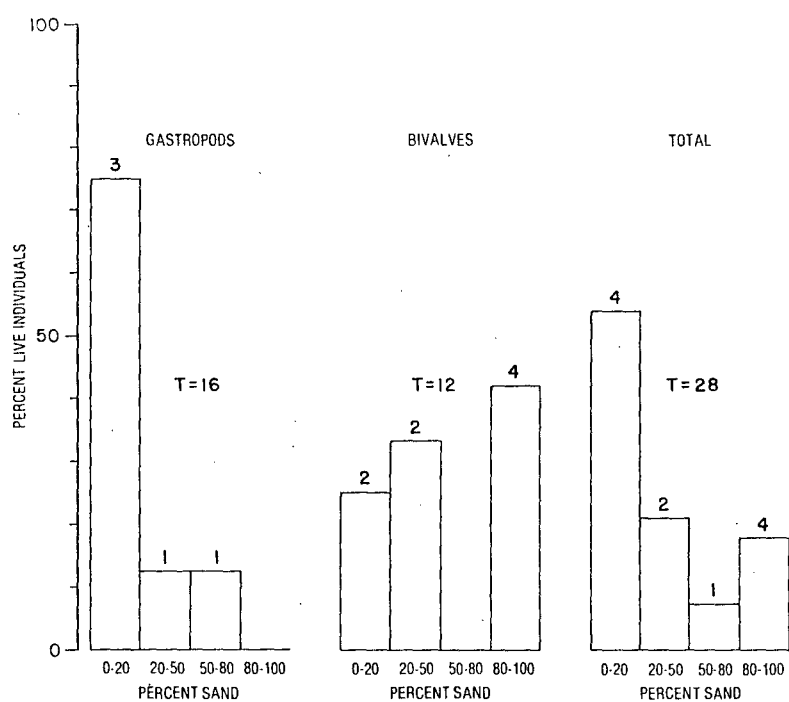


Figure 16. Distribution of percent live individuals from Trinity Bay by sediment type. Number of stations is shown above bar. T equals total number of individuals.

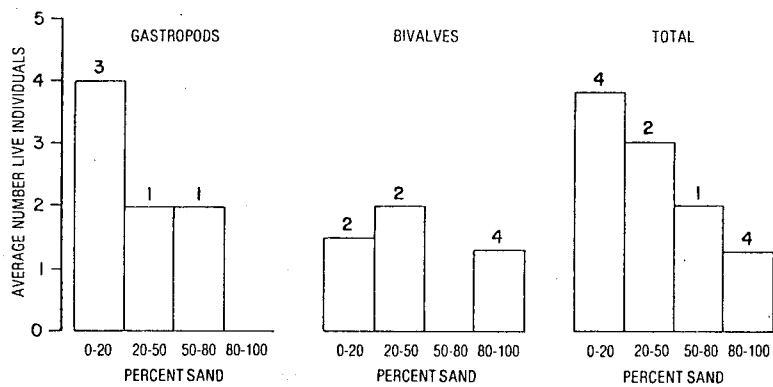


Figure 17. Distribution of average number of live individuals from Trinity Bay by sediment type. Number of stations is shown above bar.



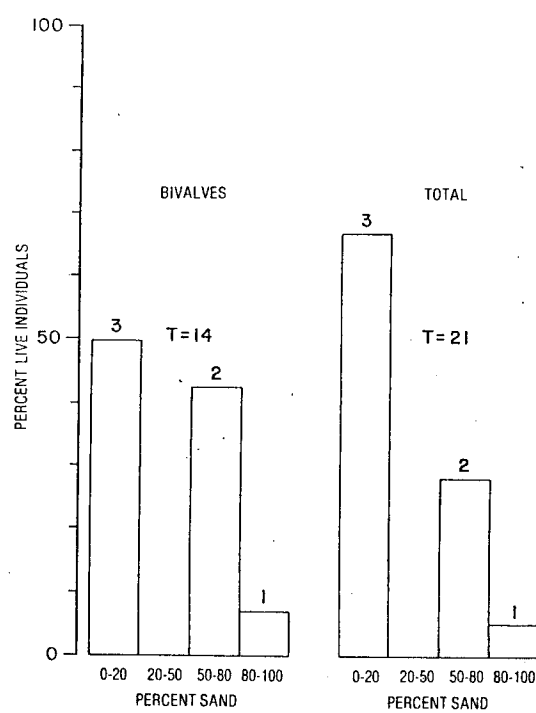


Figure 18. Distribution of percent live individuals from East Galveston Bay by sediment type. Number of stations is shown above bar. T equals total number of individuals.

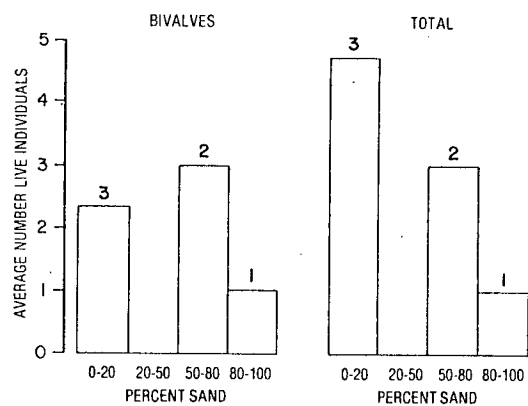


Figure 19. Distribution of average number of individuals from East Galveston Bay by sediment type. Number of stations is shown above bar.

### West Bay

With 37 live species and 910 live individuals West Bay was more productive and had a more diverse fauna than any other in the Galveston Bay area. Thirteen of the live species were gastropods and 24 were bivalves. Seven of the live gastropod species and 15 of the live bivalve species were not found live in the other bays, while 9 of the live gastropod species and 16 of the bivalve species were not found live on the shelf. Distribution by sediment type of percent and average number of live individuals is given in figures 20 and 21.

Acteocina canaliculata was the most abundant gastropod with 69 live individuals occurring at 15 of the 29 stations in West Bay. Fifty-three percent of the live individuals occurred at stations with 80 to 100 percent sand, 39 percent occurred at stations with 20 to 50 percent sand, and the rest at stations with 50 to 80 percent sand. The average number of live individuals per station was 2.4. Distribution of live individuals was essentially confined to sandy bay margins.

Acteon punctostriatus was the next most abundant gastropod with 20 live individuals occurring at seven stations. Seventy percent of the live individuals occurred at stations with a substrate of 80 to 100 percent sand, 25 percent occurred at stations with 20 to 50 percent sand and the rest at stations with 0 to 20 percent sand.

The most abundant bivalve in West Bay was Mulinia lateralis with 368 live individuals (40.4 percent of the total live individuals collected in West Bay) from 24 of the 27 stations. It was found primarily at stations with a substrate of 20 to 50 percent sand although it was found in all four sediment types. The distribution of live populations was generally uniform throughout West Bay.

Lyonsia hyalina floridana with 195 live individuals made up 21.4 percent of the total number of live individuals found in West Bay. It occurred primarily in substrates of 50 to 80 percent sand, with most of the rest occurring in 80 to 100 percent sand.

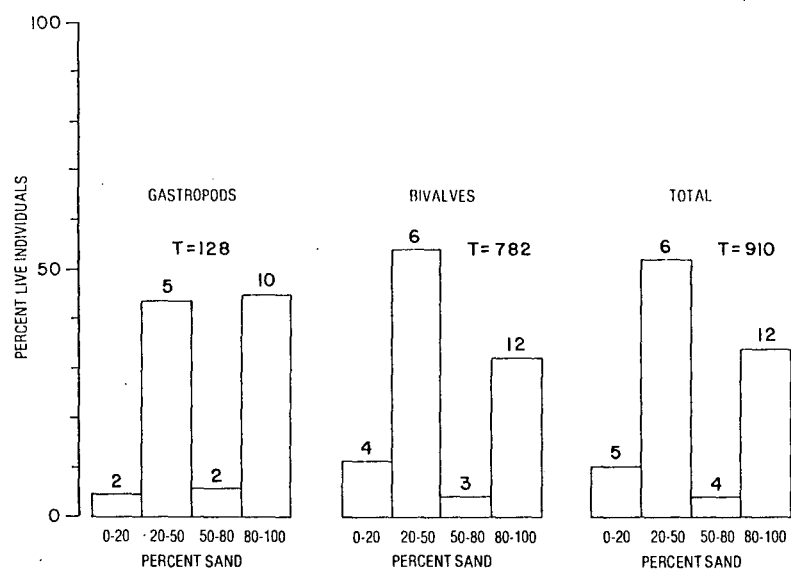


Figure 20. Distribution of percent live individuals from West Bay by sediment type. Number of stations is shown above bar. T equals total number of individuals.

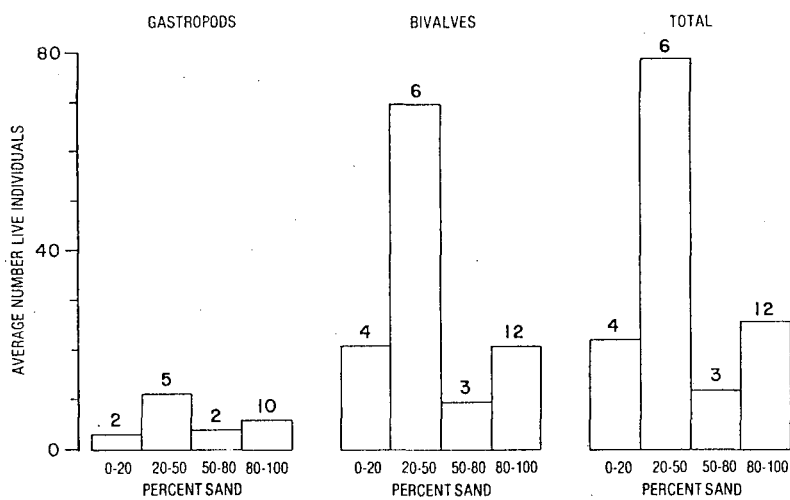


Figure 21. Distribution of average number of live individuals from West Bay by sediment type. Number of stations is shown above bar.

Only three dead individuals were collected due to the fragile nature of the shell of this species.

Mysella planulata was found live at 11 stations, most of which had a substrate of 20 to 50 percent sand. A total of 59 live individuals were collected. The distribution of Mysella is generally bay margin.

#### Inner Shelf

Forty-three live species of mollusks with 473 individuals were identified from the shelf samples examined. Twenty-six of the species were gastropods and 17 were bivalves. Two hundred seventy-five of the live individuals were gastropods and 198 were bivalves. Distribution of the average number of live species per station by sediment type is given in figure 22.

Five species of gastropods, Parvanachis obesa, Nassarius acutus, Natica pusilla, Vitrinella floridana, and Cyclostremiscus pentagonus accounted for 70 percent of the live gastropod individuals. Parvanachis obesa and V. floridana were found primarily in sediments of 0 to 50 percent sand while the other three occurred primarily in sediments of 20 to 50 percent sand.

Three species of bivalves, Tellina versicolor, Nuculana concentrica, and Abra aequalis accounted for 69 percent of the live bivalve individuals. All three species occurred primarily in sediments of 20 to 50 percent sand with 0 to 20 percent sand substrates having the next highest number of live individuals.

#### Crustacea

The class Crustacea was found to contain 72 taxa and 1,168 individuals (excluding ostracods and copepods) from the 130 samples from the Galveston area. Twenty three species were found in the Galveston Bay system, 38 species in West Bay, and 44 species from the shelf. Decapods comprised 33 taxa followed by the

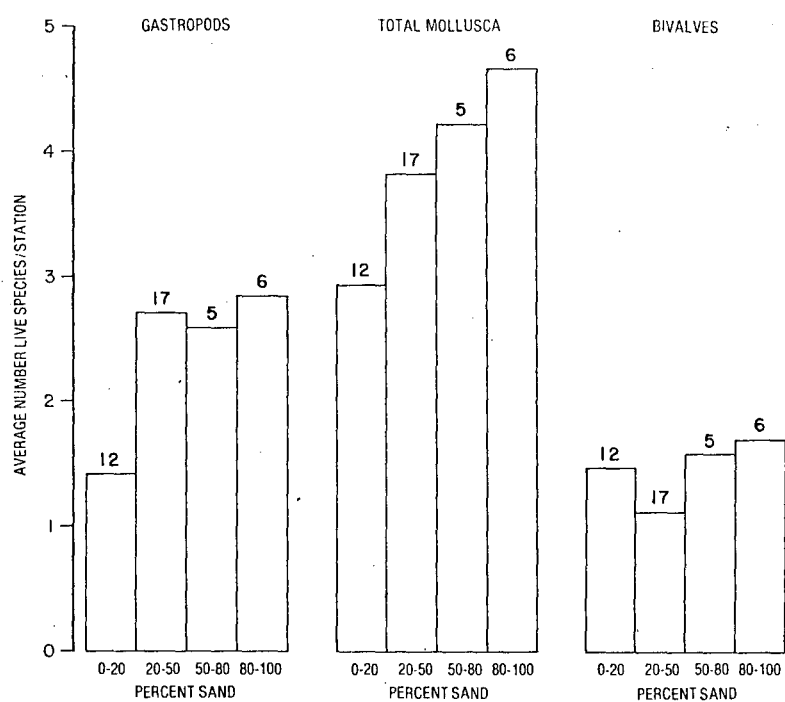


Figure 22. Distribution of average number of live species per station from the shelf by sediment type. Number of stations is shown above bar.

amphipods with 24 taxa. There were 5 mysids, 4 cumaceans, 1 apseudes, 1 tanaid, 5 isopods, and 1 stomatopod also noted. A complete listing of crustaceans identified from the Galveston area appears in table 7.

## Bays

### Trinity Bay

Trinity Bay had the lowest number of individuals of any area examined. Only 3 of the 16 stations were found to contain crustacea. Only 4 species with 13 individuals occurred. This amounted to 3.25 individuals per station and only 1.3 species per station. The highest density occurred in a station composed of 20 to 50 percent sand (fig. 22).

Corophium louisianum was the dominant species, composing 61.5 percent of all individuals. It occurred mainly at a bay margin station in upper Trinity Bay. This is one of the more stress tolerant amphipods, often associated with sand mud substrates, and often found dominant in polluted environments.

### East Bay

East Bay had the second lowest number of individuals. Only 6 of the 12 stations examined contained crustacea. Ten species and 23 individuals were found. The average number of species was 1.7 per station and for individuals was 3.9 per station. The greatest density and diversity occurred in stations containing 0 to 20 percent sand (fig. 23 and 24).

Xenanthura brevitelson was the dominant species in East Bay composing 30.4 percent of the individuals. Corophium louisianum was again found, indicating a high stress environment.

### Galveston Bay

Sixteen species composed of 50 individuals were found in Galveston Bay. The average number of species and individuals per station was 0.9 and 3.0, respectively.



Table 7. List of all crustacean species from the Galveston-Houston area.

Phylum Arthropoda

Class Crustacea

Subclass Ostracoda

Ostracods

Order Harpacticoida

Harpacticoid copepods

Order Mysidacea

Bowmaniella cf. brasiliensis

Bowmaniella cf. dissimilis

Mysidopsis almyra

Mysidopsis bigelowi

Mysidopsis sp.

Order Cumacea

Cumacean A

Cyclaspis varians

Eudorella monodon

Oxyurostylis salinai

Order Apseudidea

Apseudes sp.

Order Teraidacea

Leptochelia rapax

Order Isopoda

Ancinus depressus

Cassinidea lunifrons

Edotea montosa

Erichsonella filiformis isabellensis

Xenanthura brevitelson

Order Amphipoda

Acanthohaustorius n.sp.

Ampelisca abdita

Ampelisca agassizi

Ampelisca brevisimulata

Ampelisca sp.

Ampelisca vadorum

Ampithoe sp.

Argissa hamatipes

Cerapus tubularis

Corophium acherusicum

Corophium louisianum

Corophium sp.

Grandidierella bonnieroides

Lepidactylus n.sp.

Listriella n.sp.

Melita nitida

Monoculodes cf. nyei

Parahaustorius cf. holmesi

Pontogeneia bartschi

Trichophoxus epistomus

Suborder Caprellidea

Caprellids

Order Stomatopoda

Squilla empusa

Order Decapoda

Acetes americanus

Albunea paretii

Alpheus floridanus

Automate cf. evermanni

Automate sp.

Callianassa acanthochirus

Callianassa bififormis

Callianassa latispina

Callianassa cf. marginata

Callianassa sp.

Callinectes sapidus

Chasmocarcinus mississippiensis

Clibanarius vittatus

Eucramus praelongus

Leptochela cf. bermudensis

Leptochela serratorbita

Lucifer faxoni

Menippe mercenaria

Paguristes sp.

Pagurus sp.

Panopeus herbstii

Pelia mutica

Persephona crinata

Pilumnus sp.

Pinnixa cf. chaetoptera

Pinnixa cf. cristata

Pinnixa sayana

Pinnixa sp.

Pinnotheres ostreum

Pinnotheres maculatus

Rhithropanopeus harrisi

Upogebia affinis

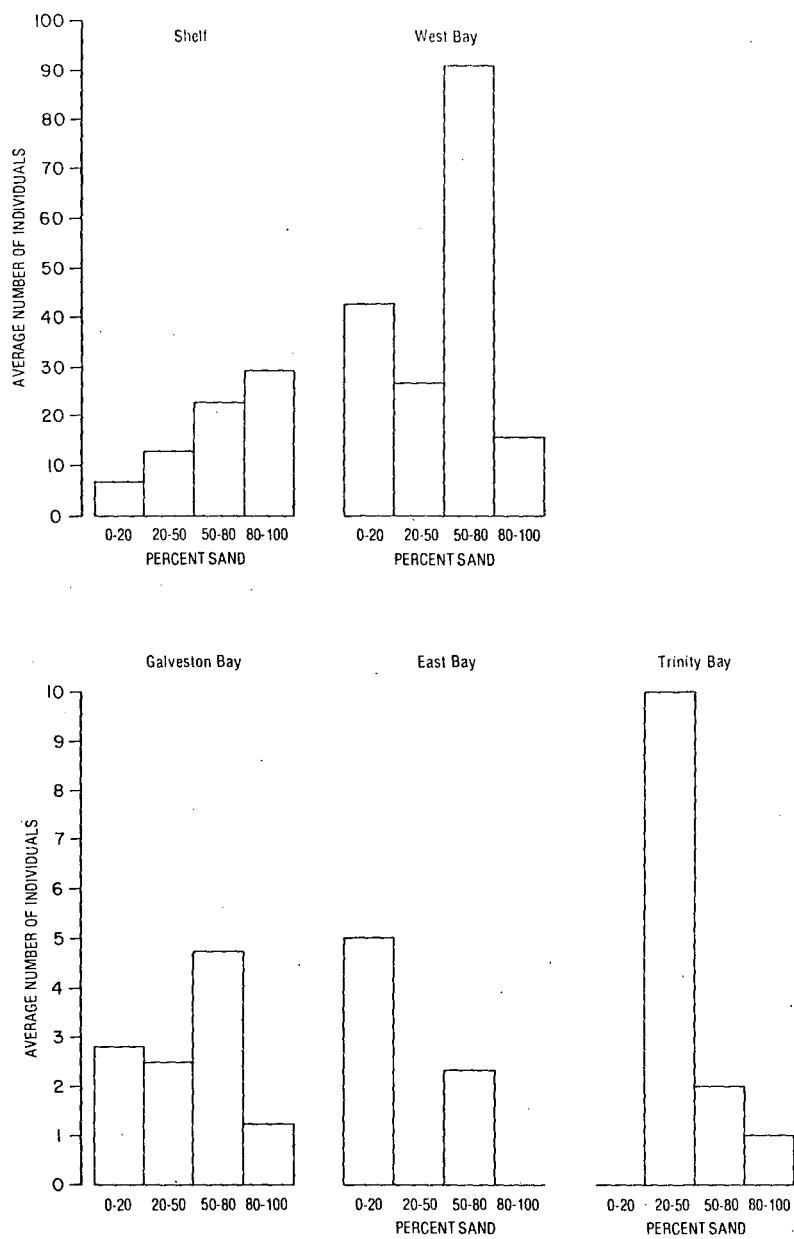


Figure 23. Crustacea, individual densities in relation to substrate.

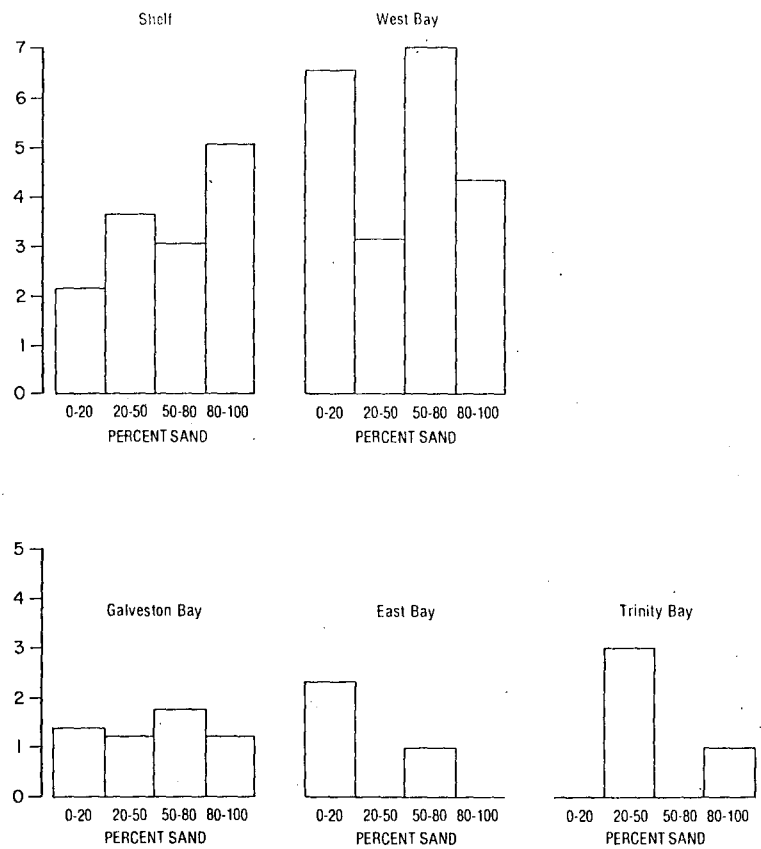


Figure 24. Crustacea, average number of species in relation to substrate.

Only 17 of the 26 stations examined contained crustacea with the highest density and diversity occurring in 50 to 80 percent sand (fig. 23 and 24).

The most abundant species in Galveston Bay were Xenanthura brevitelson and Corophium louisianum, each comprising 12 percent of all the individuals found. Corophium louisianum showed a trend toward sediments in a range of 20 to 80 percent sand, with 77.8 percent of the individuals associated with that range (fig. 25). No correlation could be made for Xenanthura brevitelson. Melita nitida and Acetes americanus were also fairly well represented, with each composing 10 percent of the total number of individuals.

Two of the amphipod species found are new to science and presently undescribed. Listriella n.sp. has been previously noted by McKinney (1977). It was found at one station in Galveston Bay. A controversy exists over the other new species, Lepidactylus n.sp. Dr. Philip Robertson is presently at work describing this species (personal communication) and eliminating the association with Say's Lepidactylus dytiscus.

#### West Bay

Stations in Chocolate, Bastrop, and Christmas Bays are included and considered a part of the West Bay system. This system had the highest average numbers of species per station (1.5) and average number of individuals (27.7) per station of any area examined. A total of 36 species containing 664 individuals were found in the 24 samples studied.

The majority of species and individuals were found in association with 50 to 80 percent sand (figs. 23 and 24). The major species, Ampelisca abdita, which composed 28.8 percent of all individuals was found 93.3 percent of the time in 20 to 50 percent sand (fig. 26).

Several other species were found to have strong sediment preferences in West Bay. All of the individuals of Xenanthura brevitelson, Acanthahaustorius n.sp.,

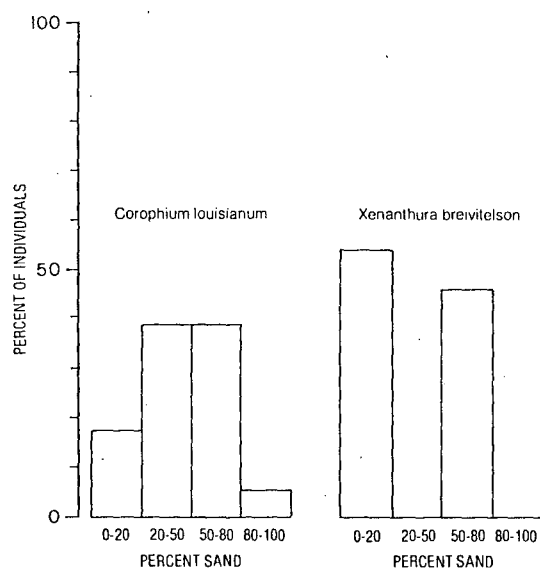


Figure 25. Crustacea, sediment preferences of dominant species in Galveston Bay.

Synchelidium americanum, and Ampelisca brevisimulata occurred only in sediments containing 80 to 100 percent sand. The cumacean, Oxyurostylis salinoi was also found in 80 to 100 percent sand, with 64 percent of the individuals found there. More complete information on sediment preferences can be seen in figures 26 and 27.

Stations with the highest number of species included 6, 18, 21, 25, 101, 111, and 122. These stations are located in northern West Bay near the Galveston causeway and near or in Chocolate Bay. Most West Bay stations were fairly low in numbers of species and individuals.

Two undescribed species of amphipods were noted in West Bay. The aforementioned Listriella n. sp. was found in greater numbers than Galveston Bay. Its distribution by sediment is plotted in figure 27. Another undescribed species of Haustoriidae, Acanthohaustorius n. sp., was found. Further studies on this species need to be done, and hopefully will be when time and procurement of equipment permits.

The West Bay fauna was particularly rich in amphipods, exhibiting 17 species. Five species of isopods were also found. Both of these represent the largest number of the areas studied. In addition, four species of cumaceans were identified.

#### Inner Shelf

Forty two species composed of 583 individuals were identified from the Gulf of Mexico. Thirty eight of the 40 stations examined contained crustacea.

The cumacean, Oxyurostylis salinoi, with 130 individuals accounted for 21.8 percent of all individuals. Decapods composed the majority of the shelf fauna comprising 56.3 percent of the individuals. Pinnixa sayana was the most abundant and prolific of the decapods.

The area of San Luis Pass was highest in numbers of crustacea, and a general trend could be seen with nearshore areas having higher density than offshore areas. Eighty to 100 percent sand contained the highest average number of individuals (fig. 23) and the highest average number of species (fig. 24).

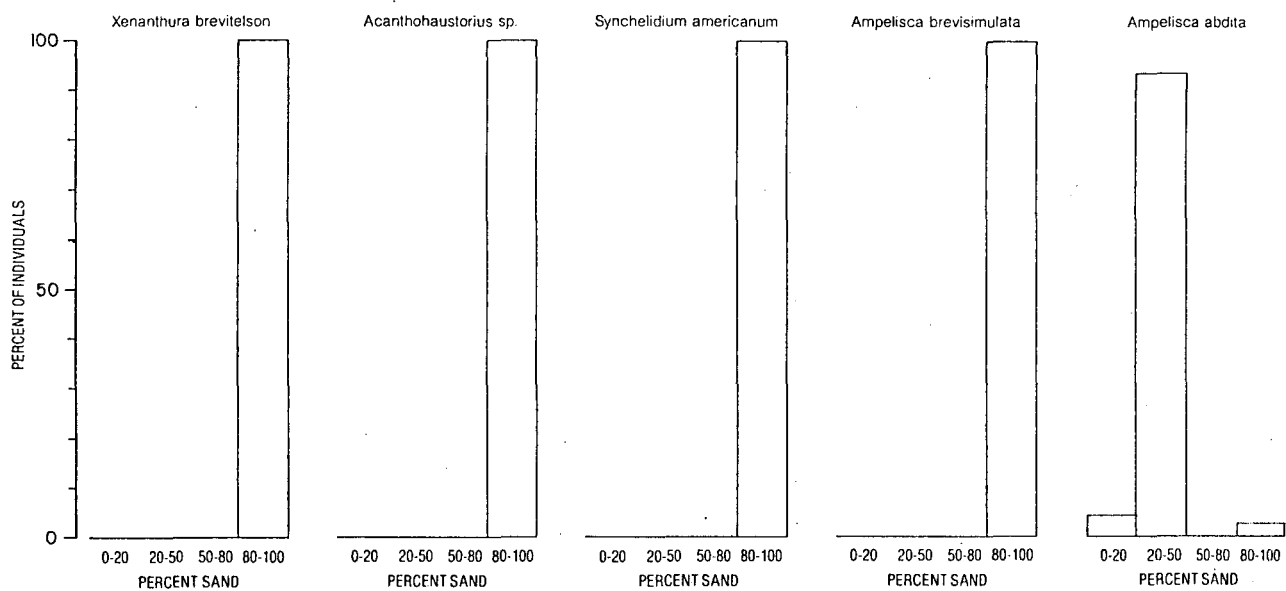


Figure 26. Crustacea, sediment preferences of dominant species in West Bay.

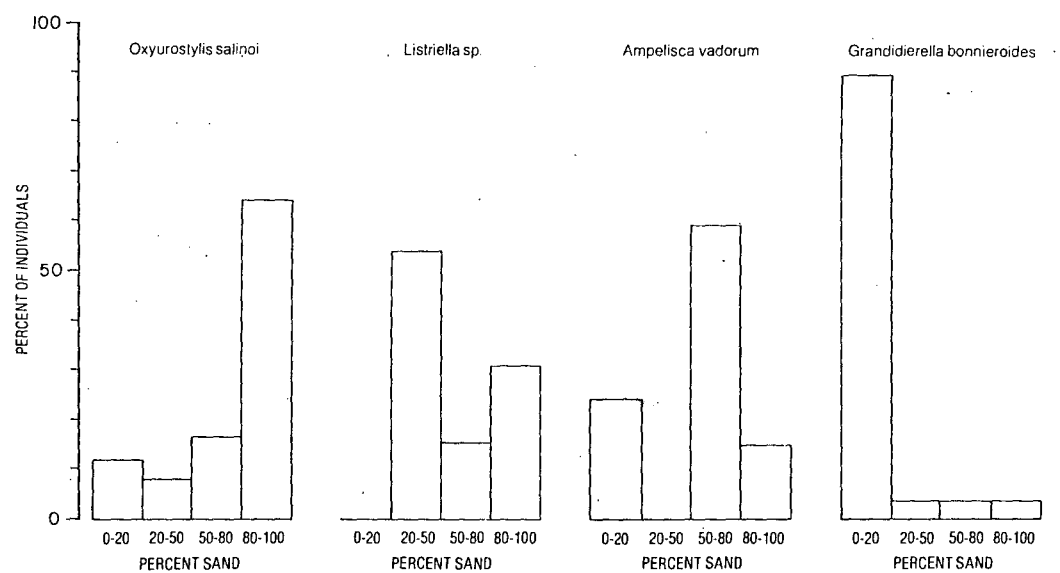


Figure 27. Crustacea, sediment preferences of dominant species in West Bay.



Species with a strong sediment association included Trichophoxus epistomus with 94.7 percent of the individuals located in 80 to 100 percent sand, Ampelisca agassizi with 80.5 percent of the individuals in 50 to 80 percent sand, and Ampelisca abdita with a 90.9 percent association in 20 to 50 percent sand. Oxyurostylis salinoides, as in West Bay still showed a preference for 80 to 100 percent sand, having 76.3 percent of the individuals occurring there. Pinnixa sayana had 92 percent of the individuals occurring in less than 50 percent sand (fig. 28).

Stations with the highest density included 2915, 2976, 3195, and 3329.

The amphipod, Listriella n.sp., previously noted as undescribed also occurred on the inner continental shelf. It was found at two stations, widely separated, but occurring fairly nearshore.

#### Other Phyla

Nemerteans occurred in all bays and in the Gulf. Nemerteans in the Gulf were more abundant than in the bays. No relationships between sediment and nemertean distribution could be seen.

The sipunculid, Phascolion strombii, was found only in West Bay and in the Gulf. P. strombii predominantly occurred in dead gastropod shells of the species, Nassarius acutus. In the Gulf, P. strombii was found at depths ranging from 18 to 60 ft but predominantly occurred at depths ranging from 18 to 24 ft and stations with 80 to 100 percent sand.

Two classes of echinoderms, Holothuroides and Ophiuroidea, were found in the Galveston samples. The ophiuroid, Amphiodia pulchella, occurred in the Gulf and West Bay; all other echinoderm species were found only in the Gulf. In the Gulf, A. pulchella occurred in depths from 18 to 48 ft and in all sediment types but predominantly in the 20 to 50 percent sands.

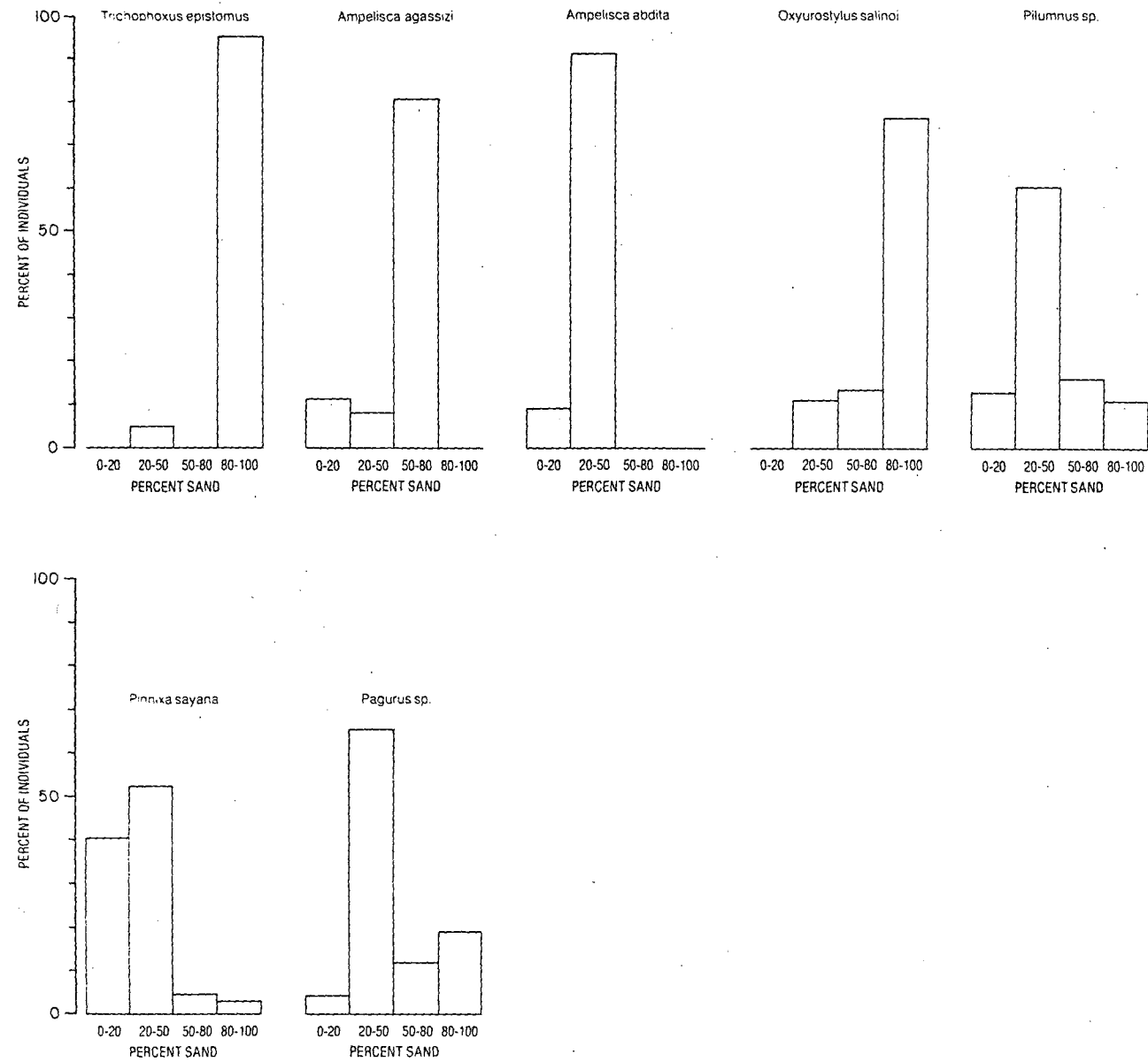


Figure 28. Crustacea, sediment preferences of dominant species on the inner Continental Shelf.

The only other abundant group were the hemichordates. Hemichordates generally occurred in the Gulf at depths less than 30 ft and in sandier (50 to 100 percent) sediments. Four specimens were also found in Galveston Bay.

#### SALINITY AND INVERTEBRATE DISTRIBUTIONS

Diversities, number of species, and number of individuals were lowest in Trinity Bay. Trinity Bay is probably more affected by seasonal salinity changes than any other bay in the Galveston Bay system. Variations in fresh-water inflow from the Trinity River and the movement of the saltwater wedge with the rise and fall of the tide, sometimes places great stress on the invertebrates in Trinity Bay.

Holland and others (1973) took monthly benthic samples at a station in mid-Trinity Bay and four other stations within the Galveston Bay system. Diversity ( $H^1$ ) values were consistently lower in Trinity Bay than at the other stations. Holland concluded that greater than normal stress at the Trinity Bay station, was due to the natural factors of temperatures and salinity.

The benthos in Trinity Bay are characteristic of low salinity bays. The mollusks, Texadina spinctostoma, T. barretti, Vioscalba louisianae, Macoma mitchelli, and Rangia flexuosa were living in Trinity Bay although none of the mollusks were considered abundant (table 6). Macoma mitchelli and Texadina spinctostoma were abundant in Copano Bay (Calnan, in press) where yearly salinities generally average less than 15‰. The polychaete, Mediomastus californiensis was the most abundant invertebrate species in Trinity Bay. M. californiensis found living throughout the Galveston Bay system but was not found living in the Gulf (table 8). Only two invertebrate species, Haploscoloplos fragilis (polychaete) and Pinnixa sayana (crustacean), were found in the Gulf and Trinity Bay (tables 9 and 10). Nemerteans were found throughout the bays and the Gulf, but since identification based on preserved specimens is practically

Table 8. Polychaete Species Found Only in Bays.

		Number			
	Species	G	T	E	W
1.	<u>Mediomastus californiensis</u>	72	31	15	68
2.	<u>Parandalia fauveli</u>	15	5	20	2
3.	<u>Streblospio benedicti</u>	40		16	30
4.	<u>Harmothoe trimaculata</u>				2
5.	<u>Alentia</u> sp.				2
6.	<u>Brania</u> sp.				1
7.	<u>Phyllodoce castanea</u>				1
8.	<u>Glycinde nordmanni</u>				29
9.	<u>Spiochaetopterus oculatus</u>				3
10.	<u>Hydroides</u> sp.				1
11.	<u>Potamilla reniformis</u>				5
12.	<u>Drilonereis</u> cf. <u>longa</u>				1
13.	<u>Megalomma bioculatum</u>				2
14.	<u>Polydora websteri</u>	15			
15.	<u>Polydora</u> sp.	2			1
16.	<u>Melinna maculata</u>	1			9
17.	<u>Magelona</u> sp. "C"				2
18.	<u>Megalonna</u> sp.				1
19.	<u>Marphysa</u> sp. "A"	9			

Gulf

G=Galveston

T=Trinity

E=East

W=West

Table 9. Polychaete Species Associated with the Gulf and Bays

	Species	Number				
		Gulf	G	T	E	W
1.	<u>Paraprionospio pinnata</u>	149	12		25	42
2.	<u>Haploscoloplos fragilis</u>	5	31	1		12
3.	<u>Nereis succinea</u>	6	16		1	112
4.	<u>Spiophanes bombyx</u>	2	1			
5.	<u>Apoprionospio pygmaea</u>	17	1			
6.	<u>Scoelelepis texana</u>	1				66
7.	<u>Capitella capitata</u>	1				48
8.	<u>Lumbrineris tenuis</u>	48				3
9.	<u>Tharyx cf. marioni</u>	1	1			
10.	<u>Cossura delta</u>	33	2			8
11.	<u>Owenia fusiformis</u>	4	1			4
12.	<u>Amphicteis gunneri</u>	1			2	
13.	<u>Diopatra cuprea</u>	55	1		2	6
14.	<u>Onuphis emerita</u>	41	1			
15.	<u>Chone americana</u>	4				16
16.	<u>Paramphinome pulchella</u>	10	2			
17.	<u>Gyptis vittata</u>	5	1		1	8
18.	<u>Sigambra bassi</u>	8	1			
19.	<u>Sigambra tentaculata</u>	21	1		2	1
20.	<u>Pista sp.</u>	3				1

Gulf

G=Galveston

T=Trinity

E=East

W=West

Table 10. Crustacean Species Associated with the Gulf and Bays.

	Species	Number				
		Gulf	G	T	E	W
1.	<u>Oxyurostylis salinoi</u>	141	1		1	25
2.	<u>Monoculodes cf. nyei</u>	1			2	22
3.	<u>Acetes americanus</u>	8	5			2
4.	<u>Pinnixa sayana</u>	112	1	1		

Crustacean Species found only in Bays.

1.	<u>Xenanthura brevitelson</u>		6		7	5
2.	<u>Cassidinidea lunifrons</u>		4			2
3.	<u>Corophium louisianum</u>		6	8	4	20
4.	<u>Mysidopsis bigelowi</u>				2	5

Gulf

G=Galveston

T=Trinity

E=East

W=West

impossible, there could be one or several nemertean species present in both the bays and the Gulf.

Salinities in upper and lower Galveston Bay are very different and faunal distributions reflect this difference. Many species characteristic of West Bay and the Gulf were found in lower Galveston Bay. Diversity was lower in upper Galveston Bay than lower Galveston Bay. Trinity Bay species were also present in upper Galveston Bay.

Both low-salinity and high-salinity species were present in East Bay. The fauna in East Bay was a mixture of Trinity and lower Galveston Bay fauna. Macoma mitchelli, Texadina barretti, Mediomastus californiensis, and Parandalia fauveli were present in both Trinity and East Bay (tables 6 and 8). Five polychaete and one crustacean species were present in East Bay, lower Galveston Bay, and the Gulf (tables 8 and 10). These euryhaline species were located in East Bay near the junction of East and lower Galveston Bay and Rollover Pass.

There were more similarities in faunal composition between West Bay and the Gulf than any other bay in the Galveston system (tables 9, and 10). Salinities in West Bay were consistently higher and more stable than any other bay in the Galveston system. Low salinity species were present in West Bay predominantly in the Chocolate Bay and Chocolate Bayou area.

## BATHYMETRY AND INVERTEBRATE DISTRIBUTIONS

### Shelf

Faunal distribution display patterns resulting from the combined influences of bathymetry and substrate. Figure 29 shows the relative percentage of deposit and suspension feeding molluscan individuals versus depth and substrate type. Suspension

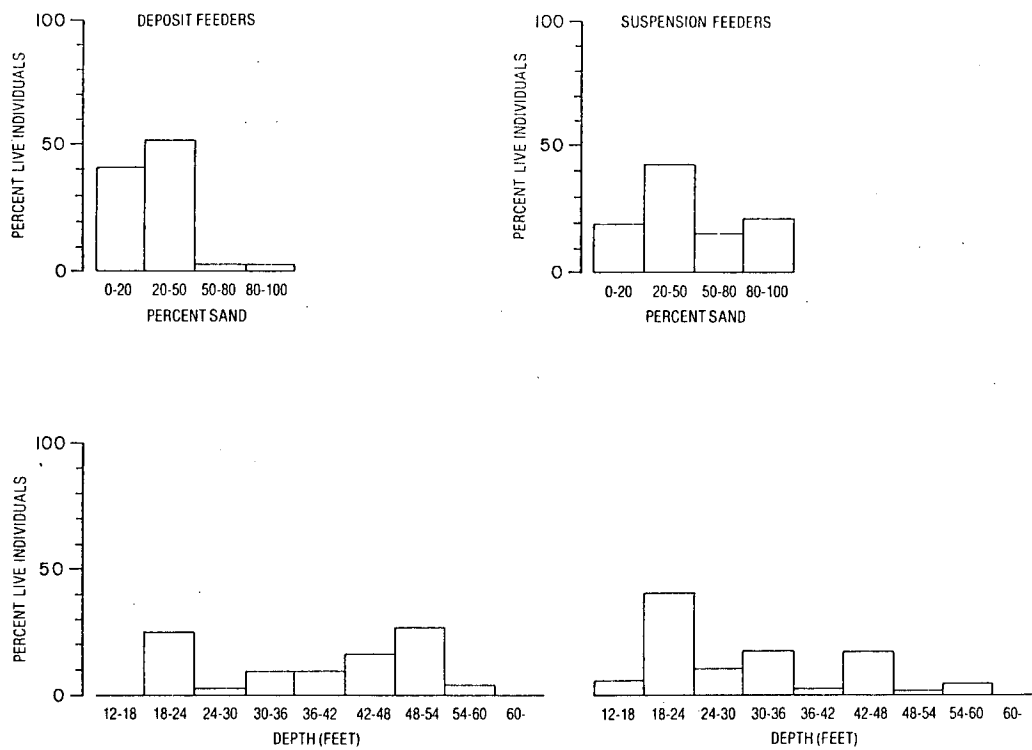


Figure 29. Distribution of deposit and suspension feeders from the shelf by sediment type and depth.



feeders tend to inhabit sandy-shallow areas. Seventy four point one percent of all suspension feeders were found live in depths of less than 36 ft. Deposit feeders are predominantly found in low sand-deep water habitats. Approximately 70 percent of all deposits feeders live in depths greater than 30 ft.

All three of the major faunal groups examined (crustaceans, polychaetes, and mollusks) primarily inhabit the nearshore area of the inner-continental shelf. Total live individuals and species of these groups display high concentrations between San Luis Pass and Bolivar Roads at less than 36 to 42 ft deep. Figure 30 indicates a decrease in the average number of live species of both Mollusca and total fauna at depths greater than the 36 to 42 ft range.

#### Faunal Distributions -- Bathymetry

##### Bays

Faunal distributions are probably not affected by bathymetry in the Galveston Bay system, due to the overall shallowness of the bays. Other factors such as substrate and salinity, exert greatest influence on benthic faunal distributions in the bays.

#### GEOCHEMISTRY AND INVERTEBRATE DISTRIBUTIONS

Distributions and densities of benthic invertebrates were significantly lower in the Galveston Bay system when compared with West Bay. Sixteen stations in the Galveston Bay zone were very high in one or more of the four heavy metals studied (table 11). The majority of these stations were in Trinity and East Bays, which had the

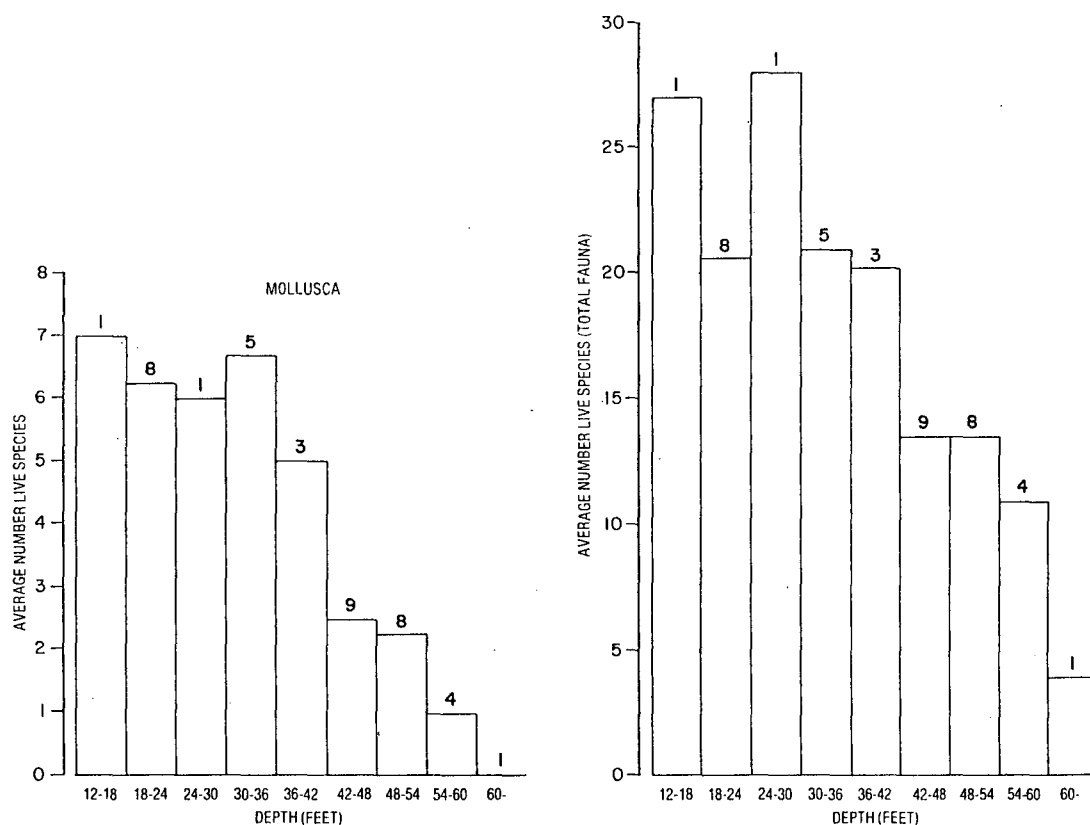


Figure 30. Distribution of the average number of live molluscan and total fauna species by depth. Number of stations examined is shown above bar.

Table 11. Galveston Bay System Stations of High Heavy Metal Concentration.

Metal	Stations												
Cr		195	198	211	222	231			288			352	358
Cu				211					288	303			391
Pb		142	198	211		231	279	281	283	288	303	326	352
Zn	70	142	198			231						358	

West Bay Stations of High Heavy Metal Concentration.

Metal	Stations	
Cr	60	97
Cu		
Pb	60	111
Zn		

lowest average densities and lowest diversities of any system studied. Those areas in Galveston Bay high in heavy metals tended to be at Bay center or near the Houston Ship Channel.

Although other factors are certainly involved, high concentrations of heavy metals seem to add significantly to the stress on benthic invertebrates in the Galveston Bay system.

Populations tend toward decreased density and diversity (table 1) with higher heavy metal contents and those species found in those areas are often pollution tolerant.

In the Galveston system, the dominant mollusk was Mulinia lateralis, which tended to be found mainly along bay margins, an area lower in heavy metal content. Mediomastus californiensis, the most abundant polychaete, was also found mainly at bay margins: only one crustacean was found in any quantity in the Galveston Bay system. Corophium louisianum, a pollution indicator, was noted at scattered stations. The obvious absence of crustacea in Galveston Bay indicates an area of high stress.

West Bay was much lower in heavy metal content. Only three stations contained any significant accumulation of the four metals studied (table 11). Most areas had high density and diversity.

It is thought that at this time, West Bay is a fairly healthy ecological system, with pollution from heavy metals playing no direct role in invertebrate populations.

#### TOTAL ORGANIC CARBON AND INVERTEBRATE DISTRIBUTION

The distribution of total organic carbon (TOC) is correlated with sediment type, the higher values of TOC being found primarily in sediments of 0 to 50 percent sand, the lower values in sediments of 50 to 100 percent sand. In such instances it is hard to correlate the distribution of invertebrates with TOC due to the substrate preferences

of various organisms. As can be seen by the data presented in tables 12 and 13, the high value TOC, low percentage sand stations had the lowest average number of live individuals and species, except in the Mollusca, than the low value TOC, high percentage sand stations. This distribution is because of the preference of the organisms listed for the 20 to 100 percent sand substrates and not the percent TOC. It can be concluded that, at least in the Galveston Bay area, no reliable correlation can be made between TOC and invertebrate distribution.

### INVERTEBRATE ASSEMBLAGES

Assemblages in the bays within the Galveston Bay system and on the inner shelf in the Galveston area were best delimited on the basis of sediment, primarily percent sand data, bathymetry, and generalized salinity data. Data on sediment-faunal relationships were probably most useful in defining assemblage boundaries, but all available data were considered. The assemblage boundaries are only as precise as the quality and quantity of the data on the various environmental variables and the number of samples examined. In many cases, too little data made it impossible to define assemblages and assemblage boundaries accurately.

Bar graphs were used to help show ties between sediment and the dominant (most abundant) fauna within a system. Species were chosen which best show these relationships and distribution maps of these species were made. All benthic groups were considered.

The assemblage boundaries are flexible. More work is needed to define the boundaries accurately. Cluster analyses would best show faunal relationships and be the most useful tool in defining assemblages.

Five bay assemblages and three Gulf assemblages were mapped, including Trinity Bay, upper and lower Galveston Bay, East Bay, West Bay assemblages, and nearshore, transitional, and offshore Gulf assemblages. Dashed lines on the assemblage map

Table 12. Distribution of feeding types by substrate and TOC-Bays.

Number of Stations	Sediment (% Sand)	Average TOC (%)		Deposit Feeders		Suspension Feeders	
				Average number of individuals	Average number of species	Average number of individuals	Average number of species
30	0-20	1.4	Polychaeta	5.1	0.7	0.5	0.3
			Mollusca	1.2	0.1	1.8	0.3
			Crustacea	7.4	1.7	0.4	0.1
			Total	4.6	0.8	0.9	0.2
21	20-50	0.9	Polychaeta	10.7	2.7	0.5	0.3
			Mollusca	0.8	0.2	20.3	2.7
			Crustacea	3.4	0.6	1.0	0.1
			Total	5.0	1.2	7.3	1.0
13	50-80	0.7	Polychaeta	8.2	1.4	0.2	0.6
			Mollusca	0.7	0.7	4.2	1.2
			Crustacea	7.5	0.8	1.6	0.2
			Total	5.5	1.0	2.0	0.7
25	80-100	0.4	Polychaeta	15.4	1.5	0.3	0.2
			Mollusca	0.1	0.1	11.8	1.8
			Crustacea	6.8	0.8	0.1	0.1
			Total	7.4	0.8	4.1	0.7

Table 13. Distribution of feeding types by substrate and TOC-Shelf.

Number of Stations	Sediment (% Sand)	Average TOC (%)		Deposit Feeders		Suspension Feeders	
				Average number of individuals	Average number of species	Average number of individuals	Average number of species
12	0-20	1.1	Polychaeta	12.7	5.9	-	-
			Mollusca	2.3	0.3	2.6	0.6
			Crustacea	1.4	0.3	-	-
			Total	5.5	2.2	2.6	0.6
17	20-50	0.9	Polychaeta	21.3	6.2	0.1	0.1
			Mollusca	2.0	0.2	4.1	0.4
			Crustacea	2.4	0.4	-	-
			Total	8.6	2.3	2.1	0.3
5	50-80	0.9	Polychaeta	25.2	8.6	0.8	0.4
			Mollusca	0.3	0.2	5.0	1.0
			Crustacea	18.2	0.8	-	-
			Total	14.6	3.2	2.9	0.7
6	80-100	0.5	Polychaeta	34.3	8.0	13.8	0.5
			Mollusca	0.3	0.2	6.0	1.0
			Crustacea	22.8	1.2	-	-
			Total	19.1	3.1	9.9	0.8

indicate the boundaries are flexible. The dominant species (table 14) and characteristics of the assemblages (table 15) are listed.

The Trinity Bay assemblage was primarily a low-salinity assemblage. Salinity was probably the dominant factor in controlling the composition of the fauna. The five species composing the assemblage were primarily located along the eastern margin of Trinity Bay in shallow waters of 0 to 50 percent sand. More samples need to be examined to better delineate an assemblage boundary.

Upper Galveston Bay fauna resemble those of Trinity Bay. Salinities are probably slightly higher in upper Galveston Bay than in Trinity Bay and the dominant sediment was slightly muddier (0 to 20 percent sand).

Higher salinities and more variable sediment types predominate in lower Galveston Bay. Three species were characteristic of the upper and lower Galveston Bay assemblage. Mulinia lateralis was the only dominant species present in both assemblages.

Only M. lateralis and Paraprionospio pinnata were present in the East Bay assemblage. They were found in muddy sediments throughout East Bay.

Seven species constituted the West Bay assemblage. All were found predominantly in the 80 to 100 percent sands along the bay margin. West Bay had a smaller area of 0 to 50 percent sands than the other bays in the Galveston system. More samples from the muddier sediments (0 to 20 percent sands) near Chocolate Bay need to be examined as there is possibly more than one assemblage in West Bay.

Substrate is probably the primary factor in determining invertebrate distributions in the Gulf. The sandier (80 to 100 percent) sediments are dominated by suspension feeders, while deposit feeders live further offshore in finer grained sediment.



Table 14. Faunal Assemblages (Bays).

Trinity Bay		Lower Galveston	
<u>Texadina</u> spp.		<u>Mulinia lateralis</u>	mollusca
<u>Vioscalba louisianae</u>	mollusca	<u>Nereis succinea</u>	polychaeta
<u>Mulinia lateralis</u>		<u>Corophium louisianum</u>	crustacea
<u>Parandalia fauveli</u>	polychaeta	West Bay	
East Bay		<u>Acteocina caniculata</u>	
<u>Mulinia lateralis</u>	mollusca	<u>Acteon punctostriatus</u>	mollusca
<u>Paraprionospia pinnata</u>	polychaeta	<u>Mysella planulata</u>	
Upper Galveston		<u>Haploscoloplos fragilis</u>	polychaeta
<u>Mulinia lateralis</u>	mollusca	<u>Monoculodes cf. nyei</u>	
<u>Mediomastus californiensis</u>		<u>Oxyurostylis salinoi</u>	crustacea
<u>Streblospio benedicti</u>	polychaeta	<u>Xenanthura brevitelson</u>	

Faunal Assemblages (Inner Continental Shelf)

Near Shore		Offshore	
<u>Tellina versicolor</u>		<u>Vitrinella floridana</u>	
<u>Nassarius acutus</u>	mollusca	<u>Parvanachis obesa</u>	mollusca
<u>Abra aequalis</u>		<u>Nuculana concentrica</u>	
<u>Chone</u> sp.		<u>Magelona phyllisae</u>	polychaeta
<u>Onuphis eremita</u>	polychaeta	<u>Ampelisca abdita</u>	
<u>Oxyurostylis salinoi</u>		<u>Ampelisca agassizi</u>	crustacea
<u>Trichophoxus epistomus</u>	crustacea		
Transitional Zone			
<u>Tellina versicolor</u>			
<u>Nuculana concentrica</u>			
<u>Nassarius acutus</u>	mollusca		
<u>Vitrinella floridana</u>			
<u>Parvanachis obesa</u>			
<u>Cyclostremiscus pentagonus</u>			
<u>Magelona phyllisae</u>	polychaeta		
<u>Ampelisca abdita</u>	crustacea		

Table 15. Characteristics of Benthic Faunal Assemblages in the Galveston Area

Parameters	Trinity	Upper Gulf	Lower Gulf	Assemblages		Nearshore Gulf	Transitional Gulf	Offshore Gulf
				East	West			
Number of Stations	16	10	16	12	29	8	9	23
Total Number of Species	33	42	100	58	365	246	301	516
Total Number of Individuals	87	236	203	155	2223	890	655	953
Average Number of Species per Station	2.0	4.2	6.3	4.8	12.6	30.8	33.4	22.4
75 Average Number of Individuals per Station	5.4	23.6	25.4	12.9	76.7	111.3	72.8	41.4
Salinity range (‰)	0-15	0-15	15-25	10-20	20-30	30+	35	35
Dominant sediment (% sand)	0-50	0-20	20-80	0-50	Mixed	80-100	0-50	0-50
Depth range (ft.)	2-10	2-12	2-12	2-8	2-6	12-42	18-42	36-60
Average diversity (H') per station	.75	1.09	1.55	1.17	1.56	2.62	2.32	2.06

The nearshore assemblage occurs in the 80 to 100 percent sands south of Bolivar Roads in depths ranging from 12 to 42 ft. This assemblage is primarily composed of suspension feeders from all the major invertebrate groups (table 14). Diversities are highest in this zone.

Muddier sediments of 0 to 50 percent sands are found close to shore north of Bolivar Roads. Very little sand is found offshore from Bolivar Roads to Sabine Pass. Stations 1 mi offshore north of Bolivar Roads are predominantly in the 0 to 50 percent sand range. This area of stations contains a mixture of nearshore suspension feeders and species found in the offshore assemblage (deposit feeders). North of Bolivar Roads, this transitional assemblage is found in water depths ranging from 18 to 36 ft. From Bolivar Roads to just off San Luis Pass the assemblage is found in depths ranging from 24 to just over 40 ft.

The transitional assemblage contains eight invertebrate species (table 14). Six of the eight species are mollusks. The most abundant species in this assemblage was the deposit feeding polychaete, Magelona phyllisae.

Low diversity, few species, and few individuals characterize the zone containing the offshore assemblage (table 15).

Ampelisca agassizi was the most abundant species in the offshore assemblage. Most species in the offshore assemblage zone were represented by less than 10 individuals per station.

#### DIVERSITY

The Shannon - Weaver diversity index ( $H'$ ) was used to interpret species diversity in the Galveston bays and in the Gulf of Mexico.

Most stations in Trinity Bay had a diversity index of less than one. Only a few of the bay margin, sandier stations had indices of greater than one. The average diversity in Trinity Bay was .746, lowest of any of the bays in the Galveston bay system.

Generally, diversities in upper Galveston Bay (avg. 1.089) were lower than those in lower Galveston Bay (avg. 1.553). Three stations in lower Galveston Bay had indices of greater than two. Higher values generally occurred in bay margin sands and in lower Galveston Bay near Bolivar Roads.

Average diversity in East Bay (1.174) was close to the average for upper Galveston Bay (1.089). The highest values in East Bay occurred at stations just southwest of Rollover Pass.

West Bay stations (including Chocolate, Bastrop, and Christmas Bays) had  $H'$  values that averaged 1.561, highest of any bay in the Galveston system. Stations in Bastrop, Christmas, and West Bay near San Luis Pass generally had values of greater than 2.0. Nearly 30 percent of the West Bay Stations examined had  $H'$  values of greater than 2.0; only 20 percent averaged less than 1.0. West Bay station 93 near Chocolate Bay had the highest value of any bay station examined, 2.62.

Offshore, diversity values follow two different trends: (1) south of Bolivar Roads diversity generally decreases with depth (2) north of Bolivar Roads diversity values were almost uniformly high (greater than 2.1). Nearshore stations (less than 40 ft deep) between Bolivar Roads and San Luis Pass had the highest values. Only two offshore stations, 2915 and 3499, had values of less than 1.0.

Most of the boundaries on the diversity map were highly flexible as more stations need to be examined, especially in Trinity and Galveston Bay.



## APPENDIX

GALVESTON SHELF

Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195		
Phylum Mollusca																						
Class Gastropoda																						
Family Fissurellidae																						
<i>Diodora cayenensis</i>											4	1										
Family Stenothyridae																						
<i>Vioscalba louisianae</i>			1																			
Family Vitrinellidae																						
<i>Vitrinella floridana</i>		1				3			2	2		3	2	4	2	4	20		2	1		
<i>Cyclostremiscus pentagonus</i>		1	1	3	1	1		7	2	18	2	8	2	2	12	8	1	4	32	12	8	1
<i>Anticlimax pilsbryi</i>																						
<i>Solariorbis infracarinata</i>																						
<i>Teinostoma biscaynense</i>										5			4			4	8					
<i>Teinostoma parvicallum</i>																	4					
<i>Solariorbis mooreana</i>																						
Family Cerithiidae																						
<i>Cerithiopsis greeni</i>												2					4					
<i>Seila adamsi</i>																						
Family Triphoridae																						
<i>Triphora perversa nigrocinta</i>																						

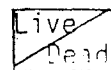
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# GALVESTON SHELF

## Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Phylum Mollusca																					
Class Gastropoda																					
Family Fissurellidae																					
<i>Diodora cayenensis</i>																					5
Family Stenothyridae																					
<i>Viosealba louisianae</i>														2							3
Family Vitrinellidae																					
<i>Vitrinella floridana</i>	2			3	2			4	3	1	2	4	2	2	4	3	12	1	2	6	25
<i>Cyclostremiscus pentagonus</i>	3	1		7	4				3	9	2	5	7	3	8	1	18			10	81
<i>Anticlimax pilsbryi</i>													4								4
<i>Solariorbis infracarinata</i>									1				2	2		4				2	7
<i>Teinostoma biscaynense</i>					2					1					2	4		2		2	30
<i>Teinostoma parvicallum</i>																					4
<i>Solariorbis mooreana</i>																		2			2
Family Cerithiidae																					
<i>Cerithiopsis greeni</i>																					6
<i>Seila adamsi</i>										4											4
Family Triphoridae																					
<i>Triphora perversa nigrocinta</i>										1											1

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# GALVESTON SHELF

## Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Epitomiidae																				
<i>Epitonium angulatum</i>													2							
<i>Epitonium rupicola</i>																				
<i>Epitonium apiculatum</i>	1			1			2			7	12	6	20	8		4	52	20		1
<i>Epitonium multistriatum</i>																	28			
Family Eulimidae																				
<i>Eulima bilineatus</i>				1				1									20			
<i>Eulima sp.</i>																				
<i>Balcis arcuata</i>																	16			
<i>Balcis jamaicensis</i>													1							
<i>Balcis sp.</i>											4									
Family Aclididae																				
<i>Henrya goldmani</i>																				
Family Calyptraeidae																				
<i>Crepidula convexa</i>				1								2					4			
<i>Crepidula fornicata</i>																	60			
<i>Crepidula plana</i>								2					10							1
<i>Crepidula sp.</i>																				

ive  
Dead



GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Epitomiidae																					
<i>Epitonium angulatum</i>															2				1		5
<i>Epitonium rupicola</i>									1												1
<i>Epitonium apiculatum</i>		1	1			6		3		6					1	4	11	4	1	2	170
<i>Epitonium multistriatum</i>								1								4	1	3		1	36
Family Eulimidae																					
<i>Eulima bilineatus</i>		2				1										4				4	25
<i>Eulina sp.</i>		1																			1
<i>Balcis arcuata</i>								1													17
<i>Balcis jamaicensis</i>		1														12					14
<i>Balcis sp.</i>																					4
Family Aclididae																					
<i>Henrya goldmani</i>															1						1
Family Calyptraeidae																					
<i>Crepidula convexa</i>										2						8				2	19
<i>Crepidula fornicata</i>																					60
<i>Crepidula plana</i>						1															14
<i>Crepidula sp.</i>																	1				1

Live  
Dead

# GALVESTON SHELF

## Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195			
Family Cymatiidae																							
<i>Cymatium</i> sp.																							
Family Naticidae																							
<i>Polinices duplicatus</i>							1	3		3			10	4	1	44				4			
<i>Natica pusilla</i>	5	16	10	2	19	4	10	3	36	2	66	152	25	96	40	1	8	792	196	56	2	3	8
<i>Sinum perversum</i>								1															
Family Turridae																							
<i>Kurtziella atrostyla</i>												1											
<i>Kurtziella cerina</i>										1				4									
<i>Kurtziella rubella</i>											4												
<i>Kurtziella</i> sp.			1									1				8							
<i>Cryoturris cerinella</i>																							
<i>Nannodiella vespuciana</i>											4												
Family Terebridae																							
<i>Terebra protexta</i>		7	21	3	2	5	2	10	10	5	8		4	20	10	36	16	24		1			
<i>Terebra concava</i>			2																8				
Family Buccinidae																							
<i>Cantharus cancellarius</i>			1			1			4		28			8	1				13				

GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Cymatiidae																					
<i>Cymatium</i> sp.		1																			1
Family Naticidae																					
<i>Polinices duplicatus</i>	1	10			3	2			2		16				8	2			1	2	117
<i>Natica pusilla</i>	1	1	1	1	2	1			2	1	2	1			1	4	3	4	4	4	4
	9	77		2	5	18			4	37	3	13	15	7	32	24	332	48	102	15	2354
<i>Sinum perversum</i>																					1
Family Turridae																					
<i>Kurtziella atrostyla</i>																					1
<i>Kurtziella cerina</i>											2									2	6
<i>Kurtziella rubella</i>											1										4
<i>Kurtziella</i> sp.														1			2			2	13
<i>Cryoturris cerinella</i>		1				1															2
<i>Nannodiella vespuciana</i>																					4
Family Terebridae																					
<i>Terebra protexta</i>	6	1	2	5		2			10	2	1	6	1		14	21	16	6	36	4	26
<i>Terebra concava</i>											1			8	6	4				2	31
Family Buccinidae																					
<i>Cantharus cancellarius</i>											1			4	6	8				6	81

Live  
Dead

# GALVESTON SHELF

## Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Nassariidae																				
<i>Nassarius acutus</i>	24			1 29	2		3 18	77	6	14 169	88	18	184	100	6	8 100	132	8		17
Family Melongenidae																				
<i>Busycon spiratum</i>																				
<i>Busycon perversum</i>																				
Family Columbellidae																				
<i>Parvanachis obesa</i>	1		2 14		1 8	20	8	6 44	108	16	112	48	3	8 48	108				1 10	
<i>Parvanachis ostreicola</i>									4		2			28						
<i>Costoanachis lafreysi</i>									16		2							8		
<i>Cosmioanachis calliglypta</i>																8				
<i>Mitrella lunata</i>																				
Family Muricidae																				
<i>Thais haemastoma</i>																				
Family Olividae																				
<i>Olivella dealbata</i>	1											1				4 24				
<i>Olivella minuta</i>																4				
<i>Oliva sayana</i>												1								

GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Nassariidae																					
<i>Nassarius acutus</i>	1 29	75	10	3	11	53	18	3	97	8	15	2 178	6 41	94	29	4 364	6 189	248	2 14	74	48 4131
Family Melongenidae																					
<i>Busycon spiratum</i>																		2			2
<i>Busycon perversum</i>		1																		2	3
Family Columbellidae																					
<i>Parvanachis obesa</i>	3 19	26	19			29			36	6	26	1 13	20	13	160	1 18	2 76	2 4		38	44 1434
<i>Parvanachis ostreicola</i>		7						10				4		12	1					1	68
<i>Costoanachis lafreysi</i>												6					2				34
<i>Cosmioanachis calliglypta</i>														2							10
<i>Mitrella lunata</i>		1						1													2
Family Muricidae																					
<i>Thais haemastoma</i>								3													3
Family Olividae																					
<i>Olivella dealbata</i>		5				6						2		4						5	42
<i>Olivella minuta</i>																				4	
<i>Oliva sayana</i>		1																			2

GALVESTON SHELF

Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Acteonidae																				
<i>Acteon punctostriatus</i>				1						2		1				36				
Family Acteocinidae																				
<i>Acteocina canaliculata</i>																				
Family Atyidae																				
<i>Volvulella persimilis</i>																				
<i>Volvulella texasiana</i>							1	2	3										1	
Family Cylichnidae																				
<i>Cylichnella bidentata</i>		2														4				
Family Pyramidellidae																				
<i>Pyramidella crenulata</i>	1		1		1					4	1						8		4	
<i>Odostomia gibbosa</i>	1	1		1		8	5		6	8	2	22			52	12			1	
<i>Odostomia dux</i>												1								
<i>Odostomia seminuda</i>										16		2			8					
<i>Eulimastoma weberi</i>				3		3			1					4	72	4				
<i>Eulimastoma teres</i>			1								14	4							3	
<i>Turbonilla interrupta</i>			2		3			8	10	40	16	24	28	16	8	4	40	8	1	3
<i>Turbonilla hemphilli</i>		3		3	1		2	2	5	8	3	10		1	8	68	16		1	
<i>Turbonilla portoricana</i>									4		12		8	4		4				

GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Acteonidae																					
<i>Acteon punctostriatus</i>			1								1									2	43
Family Acteocinidae																					
<i>Acteocina canaliculata</i>		1							2		7						6				16
Family Atyidae																					
<i>Volvulella persimilis</i>			1																	1	
<i>Volvulella texasiana</i>								1									2			10	
Family Cylichnidae																					
<i>Cylichnella bidentata</i>										1					1		1	2			11
Family Pyramidellidae																					
<i>Pyramidella crenulata</i>		4			1										2	8				2	36
<i>Odostomia gibbosa</i>	2	2							22		7	1			8	21	16	3	4	1	204
<i>Odostomia dux</i>																					1
<i>Odostomia seminuda</i>																	2		2		30
<i>Eulimastoma weberi</i>									1		1				12	36			4		133
<i>Eulimastoma teres</i>		6			8				1			1				8	2	16			64
<i>Turbonilla interrupta</i>	1	3	3	5	1	3		5	1		5	1	2	12	34	76	32	98	3	32	516
<i>Turbonilla hemphilli</i>	3	1	2	1	1			1	2		1		14	2	16	1	12	2	4	9	186
<i>Turbonilla portoricana</i>															4	12		14	2	14	68

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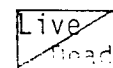
# GALVESTON SHELF

## Stations

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	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195	
Gastropoda (cont.)																					
<i>Turbonilla elegans</i>										1						24					
<i>Turbonilla</i> sp.												1									
<i>Cyclostremella humilis</i>																					
Family Cuvieridae																					
<i>Cavolina longirostris</i>								1				2									
Class Bivalvia																					
Family Nuculidae																					
<i>Nucula proxima</i>															1		6				
Family Nuculanidae																					
<i>Nuculana acuta</i>	2	1	1									2			1	8	6				
<i>Nuculana concentrica</i>	1	2	1	4	1	6		1	3	25	6	32	66	11	25	22	10	194	42	4	2
Family Arcidae																					
<i>Anadara brasiliana</i>							1	1													
<i>Anadara transversa</i>	1	1	2	1	1			1	1	3	344	353	96	58	5	380	242	12		1	
<i>Lunarca ovalis</i>		1	1	1	1	1		3	3	4	8	2	9	14	4	78	13	13		1	
Family Noetiidae																					
<i>Noetia ponderosa</i>				2					1	1	6	5	7	8	1	10	17	1		1	

88





GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Gastropoda (cont.)																					
<i>Turbonilla elegans</i>		1				1									8	4		1			40
<i>Turbonilla</i> sp.											1	63								1	64
<i>Cyclostremella humilis</i>		2																			2
Family Cuvieridae																					
<i>Cavolina longirostris</i>																					3
Class Bivalvia																					
Family Nuculidae																					
<i>Nucula proxima</i>																					7
Family Nuculanidae																					
<i>Nuculana acuta</i>						1	1		1	2		1		1	2	22		5		1	56
<i>Nuculana concentrica</i>	2	30	15	9	2	2	6	14	1	21	1	13	46	5	12	1	15	68	10	2	93
Family Arcidae																					
<i>Anadara brasiliana</i>						1			1			1								1	4
<i>Anadara transversa</i>	2	19			1	4		3	41	1	1	4	3	44	2	122	9	30	36	14	335
<i>Lunarca ovalis</i>	2	8	1	2	1	2		2	4	1	3	9	1	4	5	38	21	31	8	12	32
Family Noetiidae																					
<i>Noetia ponderosa</i>		1				1			2	1	1	1	1	7	1		3	7	4	6	96

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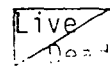
Live

GALVESTON SHELF

Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Pectinidae																				
<i>Argopecton gibbus</i>			1								4	2								
Family Plicatulidae																				
<i>Plicatula gibbosa</i>			1								63	22	3	8	2	2	62	4		
Family Anomiidae																				
<i>Anomia simplex</i>							1			1	34	48	1	4	2		20	20		
Family Ostreidae																				
<i>Crassostrea virginica</i>								1	1						1			16		
<i>Ostrea equestris</i>		1	1	1		1			3	1	38	19	9	14	3	36	164	28		
Family Lucinidae																				
<i>Linga amiantus</i>										1	12	8	6		4	12	34	8		
<i>Parvilucina multilineata</i>											4	2					2		1	1
Family Unculinidae																				
<i>Diplodonta soror</i>						1							1							
<i>Diplodonta semiaspera</i>							1					1								
Family Chamidae																				
<i>Pseudochama radians</i>											26			6			6			
<i>Arcinella cornuta</i>												1								
<i>Chama congregata</i>												6						4		

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# GALVESTON SHELF

## Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Pectinidae																					
<i>Argopecton gibbus</i>																				1	8
Family Plicatulidae																					
<i>Plicatula gibbosa</i>	1	1													1					1	171
Family Anomiidae																					
<i>Anomia simplex</i>						1			1												133
Family Ostreidae																					
<i>Crassostrea virginica</i>									1	1										1	22
<i>Ostrea equestris</i>	4	3			4	5		1	26	3	2		8	37	6	38	4	14	8	28	510
Family Lucinidae																					
<i>Linga amiantus</i>						1			1					5	1	8			1	3	12
<i>Parvilucina multilineata</i>		1			1															1	11
Family Unculinidae																					
<i>Diplodonta soror</i>																					2
<i>Diplodonta semiaspera</i>																					2
Family Chamidae																					
<i>Pseudochama radians</i>																					38
<i>Arcinella cornuta</i>																					1
<i>Chama congregata</i>																					10

# GALVESTON SHELF

## Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Kelliidae																				
<i>Aligena texasiana</i>																4				
Family Montacutidae																				
<i>Mysella planulata</i>								1												1
Family Sportellidae																				
<i>Ensitellops</i> sp.												1					2			
Family Crassatellidae																				
<i>Crassinella lunulata</i>	1							2			88	50	10	16		4	208		1	1
<i>Crassinella</i> sp.								1												
Family Cardiidae																				
<i>Trachycardium muricatum</i>											6	1							1	
<i>Laevicardium robustum</i>																2				
<i>Calocardia texasiana</i>																				
Family Mactridae																				
<i>Mulinia lateralis</i>	172	1		124			1	21	34		225	6	3	133	14	4016	122			154
<i>Rangia cuneata</i>			1												2	2				
<i>Raeta plicatella</i>										1										
Family Solenidae																				
<i>Solen viridis</i>																				

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GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Kelliidae																					
<i>Aligena texasiana</i>																					4
Family Montacutidae																					
<i>Mysella planulata</i>	1																	1			4
Family Sportellidae																					
<i>Ensitellops sp.</i>																					3
Family Crassatellidae																					
<i>Crassinella lunulata</i>	2	1			2	1			12	4								1	1	2	407
<i>Crassinella sp.</i>					1																2
Family Cardiidae																					
<i>Trachycardium muricatum</i>																					8
<i>Laevicardium robustum</i>																					2
<i>Calocardia texasiana</i>											1							1			2
Family Mactridae																					
<i>Mulinia lateralis</i>	11	570	1		108	177		1	220	12		186	502	29	7	762	516	208	65	8	8408
<i>Rangia cuneata</i>														9	2	18	2	7	3	25	71
<i>Raeta plicatella</i>												1									2
Family Solenidae																					
<i>Solen viridis</i>												2						1			1

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Live

# GALVESTON SHELF

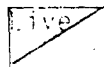
## Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195	
Family Cultellidae																					
<i>Ensis minor</i>				1																	
Family Tellinidae																					
<i>Tellina versicolor</i>	1			4	4		5	1	2	3	3	4	5	2	4	1	20	71		5	1
<i>Tellina alternata</i>																					
<i>Macoma tenta</i>												1				1					
<i>Macoma tageliformis</i>												4									
<i>Tellina sp.</i>																					
Family Donacidae																					
<i>Donax texasianus</i>							1														
<i>Donax variabilis</i>																					
<i>Donax sp.</i>																	2				
Family Semelidae																					
<i>Semele bellastriata</i>												4									
<i>Semele nuculoides</i>											2	1					10				
<i>Semele purpurescens</i>												2									
<i>Semele sp.</i>																	2				
<i>Abra aequalis</i>	2	8		3	14	1	1	101	3	139	91	49	165	54	35	357	66		5	4	1

GALVESTON SHELF

Stations

	3109	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Cultellidae																					
<i>Ensis minor</i>					1																2
Family Tellinidae																					
<i>Tellina versicolor</i>		6 1			4 1	10 5			11 2		2 1	3		4		22 2	2	10 1			79 144
<i>Tellina alternata</i>						1															2
<i>Macoma tenta</i>						1		1				2									1 4
<i>Macoma tageliformis</i>																					4
<i>Tellina sp.</i>	7																				7
Family Donacidae																					
<i>Donax texasianus</i>										1											2
<i>Donax variabilis</i>									11												11
<i>Donax sp.</i>																					2
Family Semelidae																					
<i>Semele bellastriata</i>																					4
<i>Semele nuculoides</i>																					13
<i>Semele purpurescens</i>																					2
<i>Semele sp.</i>																					2
<i>Abra aequalis</i>	1 9	5	1	1	1	9			3 4	21	1	20	115	7	6 19	68	4 174	3 26	98	9	33 24 116



GALVESTON SHELF

Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Solecurtidae																				
<i>Tagelus divisus</i>												1								
Family Dreissenidae																				
<i>Mytilopsis leucophaeta</i>																				
Family Veneridae																				
<i>Gouldia cerina</i>												3								
<i>Dosinia discus</i>	1			3			1	1				1	1			74	2			15
<i>Chione intapurplea</i>											2	1								
<i>Chione clenchi</i>											6	6			1		2	13		
<i>Chione grus</i>												1								
<i>Mercenaria campechiensis</i>	1	1						1								17				
Family Petricolidae																				
<i>Petricola pholadiformis</i>																				
Family Myidae																				
<i>Paramya subovata</i>								5		8										1
Family Corbulidae																				
<i>Corbula barrattiana</i>																				
<i>Corbula contracta</i>		1	15	1		5		4	13	10	40	59	24	38	14	14	80	16		
<i>Corbula dietziana</i>																				



GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Solecurtidae																					
<i>Tagelus divisus</i>																					1
Family Dreissenidae																					
<i>Mytilopsis leucophaeta</i>																				1	1
Family Veneridae																					
<i>Gouldia cerina</i>																					3
<i>Dosinia discus</i>		7		1	1	2		3		1	3	8	1			4		3		5	128
<i>Chione intapurpurea</i>																					3
<i>Chione clenchi</i>								1					2			1					32
<i>Chione grus</i>																					1
<i>Mercenaria campechiensis</i>		1															1	1			23
Family Petricolidae																					
<i>Petricola pholadiformis</i>													1	2	5			8		10	16
Family Myidae																					
<i>Paramya subovata</i>													1								15
Family Corbulidae																					
<i>Corbula barrattiana</i>															26	40	1				67
<i>Corbula contracta</i>	2	2			1			3	6	2	7		6	34			33	3		9	425
<i>Corbula dietziana</i>										3											3

Live  
Dead

# GALVESTON SHELF

## Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Corbulidae (cont.)																				
<i>Corbula swiftiana</i>																	42	20		
<i>Corbula cymella</i>												3								
<i>Corbula</i> sp.																			1	
<i>Varicorbula operculata</i>												1			5					
Family Pandoridae																				
<i>Pandora trilineata</i>								1											1	1
Family Lyonsiidae																				
<i>Lyonsia hylina floridana</i>																				
Family Periplomatidae																				
<i>Periploma margaritaceum</i>	1																			
Class Scaphopoda																				
Family Dentaliidae																				
<i>Dentalium texasianum</i>		1									36	5	2	4	1		24	8		
TOTAL	4	214	47	9	1	34	15	4	4	51	1	4	8	4	80	162	873	1752	301	17
Total number of live species	4	0	0	5	1	0	7	4	2	9	0	1	2	1	3	10	0	1	4	8

# GALVESTON SHELF

## Stations

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	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total	
Family Corbulidae (cont.)																						
<i>Corbula swiftiana</i>																	1				63	
<i>Corbula cymella</i>																					3	
<i>Corbula</i> sp.																				50	51	
<i>Varicorbula operculata</i>																					6	
Family Pandoridae																						
<i>Pandora trilineata</i>					1							1									1	4
Family Lyonsiidae																						
<i>Lyonsia hylina floridana</i>												1									1	
Family Periplomatidae																						
<i>Periploma margaritaceum</i>												1									2	
Class Scaphopoda																						
Family Dentaliidae																						
<i>Dentalium texasianum</i>		1							4					2	3	48	6	10		2	157	
TOTAL	19	9	20	5	6	17	6	5	26	4	13	17	22	5	8	26	13	19	8	473		
	136	864	31	31	145	350	32	37	612	40	114	707	60	437	296	2468	1057	1209	246	480	2687	
Total number of live species	9	3	2	3	2	6	1	2	8	0	3	7	7	6	2	2	9	6	7	3		

Live  
Dead

GALVESTON SHELF

Stations

100

Phylum Arthropoda	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Class Crustacea																				
Subclass Ostracoda																				
Ostracods*																				4
Order Harpacticoida																				
Harpacticoid copepods*				4												1				
Order Cumacea																				
<i>Oxyurostylis salinoi</i>	4			29			5									1				32
Order Mysidacea																				
<i>Bowmaniella cf. brasiliensis</i>																				
Order Amphipoda																				
Family Ampeliscidae																				
<i>Ampelisca abdita</i>											3							2		
<i>Ampelisca agassizi</i>		70	7		1	1			1	1				1						
<i>Ampelisca vadorum</i>													6							
Family Argissidae																				
<i>Argissa hamatipes</i>				1																

001

GALVESTON SHELF

## Stations

[illegible]

# GALVESTON SHELF

## Stations

[illegible]

GALVESTON SHELF

## Stations

[illegible]

GALVESTON SHELF

Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Thalassinidae																				
<i>Callianassa acanthochirus</i>														2						
<i>Callianassa biformis</i>				1																
<i>Callianassa</i> cf. <i>marginata</i>																				
<i>Callianassa</i> sp.								1												
Family Upogebiidae																				
<i>Upogebia affinis</i>																				
Family Sergestidae																				
<i>Acetes americana</i>				1			2													
<i>Lucifer faxoni</i>																				
Family Pasiphaeidae																				
<i>Leptochela</i> cf. <i>bermudensis</i>																				
<i>Leptochela serratorbita</i>																				
Family Leucosiidae																				
<i>Persephona crinata</i>	1							1		2		1								
Family Xanthidae																				
<i>Menippe mercenaria</i>																				
<i>Panopeus herbstii</i>											1					2				
<i>Pelia mutica</i>																				



GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Thalassinidae																					
<i>Callianassa acanthochirus</i>																					2
<i>Callianassa biformis</i>				3		2	1														6
<i>Callianassa latispina</i>	1																				1
<i>Callianassa cf. marginata</i>														4							4
<i>Callianassa sp.</i>																					1
Family Upogebiidae																					
<i>Upogebia affinis</i>														17					1		18
Family Sergestidae																					
<i>Acetes americana</i>											3								2		8
<i>Lucifer faxoni</i>				1													1				2
Family Leucosiidae																					
<i>Leptochela cf. bermudensis</i>			1											1							2
<i>Leptochela serratorbita</i>		1																			1
Family Xanthidae																					
<i>Menippe mercenaria</i>														4							4
<i>Panopeus herbstii</i>								3													6
<i>Pelia mutica</i>		1																			1

GALVESTON SHELF

Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
<i>Pilumnus</i> sp.				2			10			12			2						1	5
<i>Rhithropanopeus harrisi</i>		1																		
Family Albuneidae																				
<i>Albunea paretii</i>				2																2
Family Pinnotheridae																				
<i>Pinnixa sayana</i>							3	1	6	11	1		4	2	1	7	2		3	3
<i>Pinnixa</i> sp.				1																
<i>Pinnixa</i> cf. <i>retinents</i>									1											
<i>Pinnixa</i> cf. <i>chaetoptera</i>																3				
<i>Pinnixa</i> cf. <i>cristata</i>																				
<i>Pinnotheres maculatus</i>											1									
Family Goneplacidae																				
<i>Chasmocarcinus mississippiensis</i>									1											
Family Paguridae																				
<i>Pagurus</i> sp.				3									1			16				
Family Diogenidae																				
<i>Paguristes</i> sp.																				
Family Portunidae																				
<i>Callinectes sapidus</i> (1st. crab stage)							1													

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## GALVESTON SHELF

## Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
<i>Pilumnus</i> sp.	21	1							6			2								2	64
<i>Rhithropanopeus harrissi</i>														2	2						5
Family Albuneidae																					
<i>Albunea paretii</i>											1										
Family Pinnotheridae																					
<i>Pinnixa sayana</i>	5		1	7				2	41					3	4	3				2	112
<i>Pinnixa</i> sp.		3											1						1		6
<i>Pinnixa</i> cf. <i>retinens</i>																					1
<i>Pinnixa</i> cf. <i>chaetopterana</i>																					3
<i>Pinnixa</i> cf. <i>cristata</i>					10					1											11
<i>Pinnotheres maculatus</i>																					1
Family Goneplacidae																					
<i>Chasmocarcinus mississippiensis</i>											1										2
Family Paguridae																					
<i>Pagurus</i> sp.					2	3			1												26
Family Diogenidae																					
<i>Paguristes</i> sp.																	1				1
Family Portunidae																					
<i>Callinectes sapidus</i> (1st. crab stage)																					1

# GALVESTON SHELF

## Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Porcellanidae																				
<i>Euceramus praelongus</i>													1							
Brachyuran Zoea*							3						1						1	
Brachyuran megalops*																				
TOTALS <u>number of species</u>	3	3	1	8	1	1	5	4	4	5	4		7	2	3	5	1	2	2	4
<u>number of individuals</u>	6	73	7	40	1	1	21	4	9	28	6		16	4	3	29	2	3	4	42
*unidentified																				
(Totals do not include																				
unidentified specimens)																				

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GALVESTON SHELF

## Stations

[illegible]

109

GALVESTON SHELF

Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Phylum Annelida																				
Class Polychaeta																				
Family Spionidae																				
<i>Paraprionospio pinnata</i>	1	1		2	3	1	39	2	1			1		1		13				16
<i>Spiophanes bombyx</i>				1																
<i>Apoprionospio pygmaea</i>				1																5
<i>Malococerus indicus</i>												1								
<i>Scolelepis cf. texana</i>																				
Family Capitellidae																				
<i>Capitella capitata</i>																				
<i>Notomastus hemipodus</i>																				6
<i>Notomastus sp.</i>				1				1												
Family Lumbrineridae																				
<i>Ninoe nigripes</i>		2						4		1				1	2			1		
<i>Lumbrineris parvapedata</i>				4		1	1					1	1					1		
<i>Lumbrineris tenuis</i>						1				10	3	1		1						
<i>Lumbrineris sp. "A"</i>									1				2					1		
<i>Lumbrineris sp.</i>									1											

GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Phylum Annelida																					
Class Polychaeta																					
Family Spionidae																					
<i>Paraprionospio pinnata</i>	12	7				11			2		2		3		4	9	12	2	3	1	149
<i>Spiophanes bombyx</i>	1																				2
<i>Apoprionospio pygmaea</i>		11																			17
<i>Malococerus indicus</i>													1								1
<i>Scoelelepis cf. texana</i>												1									1
Family Capitellidae										1											1
<i>Capitella capitata</i>						1															1
<i>Notomastus hemipodus</i>		7																			13
<i>Notomastus sp.</i>																					2
Family Lumbrineridae				1			1														2
<i>Ninoe nigripes</i>	1						1	1		1	4				3			4			26
<i>Lumbrineris parvapedata</i>						7			1									3			20
<i>Lumbrineris tenuis</i>	2								1		1		6				3				29
<i>Lumbrineris sp. "A"</i>																					4
<i>Lumbrineris sp.</i>		1								3	1						3		4		13

III

GALVESTON SHELF

Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Maldanidae																				
<i>Clymenella torquata</i>									3		2			2	4	1				
<i>Asychis carolinae</i>																				
<i>Branchioasychis americana</i>																1			1	
<i>Axiiothella mucosa</i>																3				
<i>Axiiothella</i> sp.																				
<i>Asychis</i> sp.											1									
Family Nereidae																				
<i>Nereis succinea</i>															1	3				
<i>Ceratonereis</i> sp. "A"																				
<i>Nereis</i> sp. "A"																				
Nereid ( <i>Nicon</i> ) sp. "A"			9	1		1		1		8	2		4			7				
<i>Nereis</i> sp.	1	1																	9	
Family Glyceridae																				
<i>Glycera americana</i>				1										1						
<i>Glycera</i> sp.							5													
Family Gonaididae			1																	
<i>Glycinde</i> sp.	1																		1	



GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Maldanidae						1															1
<i>Clymenella torquata</i>				1				2							1						16
<i>Asychis carolinae</i>				1			3	3			1				5						13
<i>Branchioasychis americana</i>	1			1																	4
<i>Axiothella mucosa</i>	1																	1			5
<i>Axiothella sp.</i>																1					1
<i>Asychis sp.</i>								1													2
Family Nereidae														1					1		2
<i>Nereis succinea</i>													1								5
<i>Ceratonereis sp. "A"</i>																				2	2
<i>Nereis sp. "A"</i>										3											3
Nereid ( <i>Nicon</i> ) <i>sp. "A"</i>						2			7			2	1			1	4				50
<i>Nereis sp.</i>																		2			13
Family Glyceridae																					2
<i>Glycera americana</i>																					2
<i>Glycera sp.</i>																					5
Family Gonaididae														1							2
<i>Glycinde sp.</i>																1					3

## GALVESTON SPLLF

## Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Nepthyidae																				
<i>Nepthys incisa</i>									3											
<i>Nepthys</i> sp.	1				1															
<i>Aglaophamus verrilli</i>				3							1		3							
Family Magelonidae																				
<i>Magelona</i> sp. "A"						1														
<i>Magelona phyllisae</i>		2		3	1	1	4	3		33	4	1		1	1	8		1	1	3
<i>Magelona</i> sp. "B"																				
<i>Magelona</i> sp.		1																		
Family Orbiniidae																				
<i>Haploscoloplos foliosus</i>	22																		5	
<i>Scoloplos rubra</i>													1						3	
<i>Haploscoloplos fragilis</i>																				
Family Cirratulidae																				
<i>Tharyx</i> cf. <i>marioni</i>																				
Family Phyllodocidae																				
<i>Phyllodoce</i> sp.				1									1							
Family Paraonidae																				
<i>Aricidea taylori</i>																				

## GALVESTON SHELF

## Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Nepthyidae																					
<i>Nepthys incisa</i>	1																				4
<i>Nepthys sp.</i>														1		1					4
<i>Aglaophamus verrilli</i>	1	1				4															13
Family Magelonidae																					
<i>Magelona sp. "A"</i>						1		1			1										4
<i>Magelona phyllisae</i>	4					3	2		2		2	1	1		2	3	29	1	1	1	119
<i>Magelona sp. "B"</i>								1													1
<i>Magelona sp.</i>																					1
Family Orbiniidae																					
<i>Haploscoloplos foliosus</i>		5																			32
<i>Scoloplos rubra</i>																					4
<i>Haploscoloplos fragilis</i>					6																6
Family Cirratulidae																					
<i>Tharyx cf. marioni</i>						1															1
Family Phyllodocidae																					
<i>Phyllodoce sp.</i>																					2
Family Paraonidae																					
<i>Aricidea taylori</i>		1																			1

## GALVESTON SHELF

## Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
<i>Aricidea</i> cf. <i>fragilis</i>																				
<i>Aricidea</i> sp.															1					
Family Cossuridae																				
<i>Cossura</i> <i>delta</i>								1								1		1		
Family Opheliidae																				
<i>Armandia</i> <i>agilis</i>	1							3												
<i>Armandia</i> <i>maculata</i>						1				19	4						1			
<i>Armandia</i> sp.																			2	1
Family Oweniidae																				
<i>Owenia</i> <i>fusiformis</i>							2													
Family Pectinariidae																				
<i>Pectinaria</i> <i>gouldii</i>							1						1			2			1	
<i>Pectinaria</i> cf. <i>meredithii</i>																				
Family Ampharetidae																				
<i>Amphicteis</i> <i>gunneri</i>							1													
<i>Ampharete</i> sp.																				
Family Terebellidae																		1		1
<i>Loimia</i> <i>medusa</i>	10							5		16	1					21				
<i>Pista</i> sp.				3											19					

GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
<i>Aricidea</i> cf. <i>fragilis</i>													1								1
<i>Aricidea</i> sp.																					1
Family Cossuridae																					
<i>Cossura</i> <i>delta</i>												2	1			1	23	3			33
Family Opheliidae																					
<i>Armandia</i> <i>agilis</i>			3																		7
<i>Armandia</i> <i>maculata</i>	4					1					1		1								34
<i>Armandia</i> sp.																					1
Family Oweniidae																					
<i>Owenia</i> <i>fusiformis</i>						1					1										4
Family Pectinariidae																					
<i>Pectinaria</i> <i>gouldii</i>		2				1															8
<i>Pectinaria</i> cf. <i>meredithii</i>	1																				1
Family Ampharetidae																					
<i>Amphicteis</i> <i>gunneri</i>																					1
<i>Ampharete</i> sp.		3																			3
Family Terebellidae																					2
<i>Loimia</i> <i>medusa</i>						4															57
<i>Pista</i> sp.																					22

GALVESTON SHELF

Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Family Trichobranchidae																				
<i>Terribellides stroemi</i>													1							
Family Sabellidae																				
<i>Chone americana</i>																			4	
<i>Chone sp.</i>	36						2			1										
Family Trochachaetidae																				
<i>Poecilochaetus sp.</i>																				
Family Onuphidae																				
<i>Onuphis emerita</i>	11			3			1								1	2				10
<i>Onuphis sp.</i>																			1	
<i>Diopatra cuprea</i>		6	2				4		1	1	1	1	3	3	1		2			
Family Amphinomidae																				
<i>Paramphinome pulchella</i>				5															5	
<i>Pseudoerythoe ambigua</i>																				
Family Hesionidae																				
<i>Gyptis vittata</i>									2											
Family Sigalionidae																				
<i>Sthenelais boa</i>																			2	
<i>Sthenolepis japonica</i>																				

GALVESTON SHELF

Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Family Trichobranchidae																					
<i>Terribellides stroemi</i>																					1
Family Sabellidae																					
<i>Chone americana</i>																					4
<i>Chone</i> sp.		56																			95
Family Trochachaetidae																					
<i>Poecilochaetus</i> sp.													1								1
Family Onuphidae																					
<i>Onuphis emerita</i>		13																			41
<i>Onuphis</i> sp.	1																				2
<i>Diopatra cuprea</i>	1		4	3	3			1	6		6				2					1	52
Family Amphinomidae																					
<i>Paramphinome pulchella</i>																					10
<i>Pseudoerythoe ambigua</i>						1			1				1								3
Family Hesionidae																		1			1
<i>Gyptis vittata</i>	1												1		1						5
Family Sigalionidae		2																			2
<i>Sthenelais boa</i>																					2
<i>Sthenolepis japonica</i>	1																				1

GALVESTON SHELF

## Stations

		2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
<i>Sthenelais</i> sp.																					
Family Pilargiidae																					
<i>Sigambra bassi</i>								6												1	
<i>Sigambra tentaculata</i>								3								1				2	2
<i>Sigambra wassi</i>																					
cf. <i>Otopsis longipes</i>																					
Family Palmyridae																					
<i>Paleonotus heterosetae</i>																					
120	Family Eulephthidae							1													
	<i>Grubeulepis sulcatisetis</i>							1													
Family Polynoidae																					
<i>Harmothoe imbricata</i>																					
<i>Lepidasthenia maculata</i>																					
<i>Harmothoe</i> sp. "A"														1							
Harmothinae																					
<i>Harmothoe</i> sp.																1					
SUBTOTAL	Individuals Species	87 10	13 6	12 3	29 13	5 3	7 3	65 7	26 13	12 9	89 7	19 8	7 9	17 9	10 7	32 10	62 10	3 2	6 6	8 6	74 16



GALVESTON SHELF

## Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
<i>Sthenelais sp.</i>						1															1
Family Pilargiidae																					
<i>Sigambra bassi</i>	1																				8
<i>Sigambra tentaculata</i>	1	2		1			3	1				2	1					2			20
<i>Sigambra wassi</i>			1																		1
cf. <i>Otopsis longipes</i>																1					1
Family Palmyridae																					
<i>Paleonotus heterosetae</i>															1						1
Family Eulepthidae																					1
<i>Grubeulepis sulcatisetis</i>																					1
Family Polynoidae				1			1														2
<i>Harmothoe imbricata</i>						1															1
<i>Lepidasthenia maculata</i>								1													1
<i>Harmothoe sp.</i> "A"																					1
Harmothinae						1															1
<i>Harmothoe sp.</i>														1			1				3
SUBTOTAL	Individuals Species	35 17	111 13	8 3	9 7	9 2	42 17	11 6	12 9	20 7	7 3	20 10	8 5	14 12	10 5	19 8	21 9	73 7	18 8	10 5	5 4

# GALVESTON SHELF

## Stations

	2909	2915	2919	2976	2980	2984	2997	2999	3003	3021	3023	3025	3087	3089	3093	3129	3133	3139	3181	3195
Phylum Nemertinea																				
Nemerteans (unidentified)		1					2				1		1			2	1			1
Phylum Sipunculida																				
<i>Phascolion strombii</i>				3						9	1						1		1	15
Sipunculid sp. "A"																		1		
Phylum Echinodermata																				
Class Ophiuroidea																				
<i>Ophiophragmus moorei</i>				1							1									1
<i>Hemipholis elongata</i>								1												
<i>Amphiodia pulchella</i>										2		1								
Ophiuroid (unidentified)									1											
Class Holothuroidea																				
Holothuroid (unidentified)																				
Phylum Hemichordata																				
Class Eteropneusta				12			31													9
<i>Subphylum Cephalochordata</i>																				
<i>Branchiostoma sp.</i>																				2
TOTALS	98	87	19	98	7	8	132	48	26	177	28	9	38	22	39	133	6	18	84	122
Live individuals	17	10	4	29	5	8	27	18	7	24	16	8	19	10	16	24	6	8	23	35
AVERAGE																				
Live individuals	55.3																			
Live species	15.6																			

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# GALVESTON SHELF

## Stations

	3199	3239	3245	3249	3283	3285	3289	3293	3329	3333	3337	3347	3351	3355	3423	3429	3433	3495	3499	3511	Total
Phylum Nemertinea																					
Nemerteans (unidentified)	2											4			1				13		29
Phylum Sipunculida																					
<i>Phascolion strombii</i>	4	34		1										2				3			74
Sipunculid <i>sp.</i> "A"																					
Phylum Echinodermata																					
Class Ophiuroidea																					
<i>Ophiophragmus moorei</i>																					3
<i>Hemipholis elongata</i>																					1
<i>Amphiodia pulchella</i>						4								1		3	3		1		15
Ophiuroid (unidentified)																					1
Class Holothuroidea				1																	1
Holothuroid (unidentified)																					
Phylum Hemichordata																					
Class Eteropneusta						3							2								57
<i>Subphylum Cephalochordata</i>																					
<i>Branchiostoma sp.</i>		1			1																4
TOTALS	68	179	30	30	46	82	17	20	96	9	35	28	35	56	87	34	61	28	54	18	
Live individuals	23	25	7	16	12	28	7	13	19	4	20	14	22	20	14	13	22	14	19	12	
Live species																					
AVERAGE																					
Live individuals	55.3																				
Live species	15.6																				

GALVESTON BAY [G]

Stations

1 7 9 16 18 21 34 42 44 54 70 75 77

Phylum Mollusca																			
Class Gastropoda																			
Family Littoridinidae																			
<i>Texadina barretti</i>																			
<i>Texadina sphinctostoma</i>				1															
Family Vitrinellidae																			
<i>Teinostoma biscaynense</i>			1	3															
<i>Vitrinella floridana</i>			3																
Family Caecidae																			
<i>Caecum johnsoni</i>						4						3							
<i>Caecum nitidum</i>			4																
<i>Caecum pullochelum</i>			2																
Family Cerithiidae																			
<i>Bittium varium</i>			1																
<i>Seila adamsi</i>	1																		
Family Epitoniidae																			
<i>Epitonium angulatum</i>					2														
<i>Epitonium apiculatum</i>	1									1		2							

124

Live  
Dead

# GALVESTON BAY [G]

		Stations																		Total
		111	137	142	181	195	238	279	281	283	303	311	352	391						
125	Phylum Mollusca																			
	Class Gastropoda																			
	Family Littoridinidae																			
	<i>Texadina barretti</i>						6	2	1			7							16	
	<i>Texadina sphinctostoma</i>			1	4	3	60	7	2		1	1						5	78	
				3	3															
	Family Vitrinellidae																			
	<i>Teinostoma biscaynense</i>																		4	
	<i>Vitrinella floridana</i>			1															4	
	Family Caecidae																			
	<i>Caecum johnsoni</i>																		7	
	<i>Caecum nitidum</i>																		4	
	<i>Caecum pullochelum</i>																		2	
	Family Cerithiidae																			
	<i>Bittium varium</i>																		1	
	<i>Seila adamsi</i>																		1	
	Family Epitoniidae																			
	<i>Epitonium angulatum</i>																		2	
	<i>Epitonium apiculatum</i>						1												5	

GALVESTON BAY [G]

126

		Stations														Total	
		1	7	9	16	18	21	34	42	44	54	70	75	77			
	<i>Epitonium multistriatum</i>									1 2		3					
	<i>Epitonium rupicola</i>			1		1				1							
	Family Calyptraeidae																
	<i>Crepidula convexa</i>						2			3							
	<i>Crepidula fornicata</i>						1										
	<i>Crepidula plana</i>	1		2	1	5	2			2 11		2 2					
	Family Naticidae																
	<i>Polinices duplicatus</i>			1	1	1	4			1		1 1					
	<i>Natica pusilla</i>				4	11				11							
	Family Turridae																
	<i>Cryoturris cerinella</i>					1											
	<i>Pyrgocythara plicosa</i>	1															
	Family Nassariidae																
	<i>Nassarius acutus</i>				3		1 8	2		10		1					
	<i>Nassarius vibex</i>			2		4			1								
	Family Columbellidae																
	<i>Parvanachis obesa</i>				1	3 21						5					
	<i>Parvanachis ostreicola</i>	1						1		21		8					
	<i>Mitrella lunata</i>				2												

Live

GALVESTON BAY [G]

		Stations																	Total
		111	137	142	181	195	238	279	281	283	303	311	352	391					
127	<i>Epitonium multistriatum</i>																	1	5
	<i>Epitonium rupicola</i>																	3	
	Family Calyptraeidae																		
	<i>Crepidula convexa</i>																	5	
	<i>Crepidula fornicata</i>	1																2	
	<i>Crepidula plana</i>			11		4	3		1				1					4	44
	Family Naticidae																		
	<i>Polinices duplicatus</i>						2											1	11
	<i>Natica pusilla</i>																	26	
	Family Turridae																		
	<i>Cryoturris cerinella</i>																	1	
	<i>Pyrgocythara plicosa</i>			1			1											3	
	Family Nassariidae																		
	<i>Nassarius acutus</i>			1			5											3	28
	<i>Nassarius vibex</i>	1																8	
	Family Columbellidae																		
	<i>Parvanachis obesa</i>			4														3	31
	<i>Parvanachis ostreicola</i>					1												32	
	<i>Mitrella lunata</i>																	2	

Live

GALVESTON BAY [G]

Stations

	1	7	9	16	18	21	34	42	44	54	70	75	77							
Family Muricidae																				
<i>Thais haemastoma</i>					1															
Family Acteocinidae																				
<i>Acteocina canaliculata</i>	1		1	4	1				2	1	1	1								
Family Cylichnidae																				
<i>Cylichnella bidentata</i>				1																
Family Pyramidellidae																				
<i>Pyramidella crenulata</i>					2															
<i>Odostomia gibbosa</i>				1					2		1									
<i>Odostomia cf laevigata</i>			1		1															
<i>Odostomia impressa</i>	3		1																	
<i>Eulimastoma cf weberi</i>			1	1		1														
<i>Eulimastoma cf teres</i>	1		3	2	1				4											
<i>Eulimastoma sp.</i>									3		2									
<i>Turbonilla interrupta</i>			1	2					2		3		1							
<i>Turbonilla hemphilli</i>				1		1			7		2									
<i>Turbonilla sp.</i>					1				1											
<i>Cyclostremella humilis</i>						3														



GALVESTON BAY [G]

		Stations																		Total
		111	137	142	181	195	238	279	281	283	303	311	352	391						
Family Muricidae																				
	<i>Thais haemastoma</i>																		1	
Family Acteocinidae																				
	<i>Acteocina canaliculata</i>	1										1							2	12
Family Cylichnidae																				
	<i>Cylichnella bidentata</i>																		1	
Family Pyramidellidae																				
	<i>Pyramidella crenulata</i>																		2	
129	<i>Odostomia gibbosa</i>					4													8	
	<i>Odostomia cf laevigata</i>																		2	
	<i>Odostomia impressa</i>			16		32	2												54	
	<i>Eulimastoma cf weberi</i>					1													1	3
	<i>Eulimastoma cf teres</i>	1		1		1					1								15	
	<i>Eulimastoma sp.</i>																		5	
	<i>Turbonilla interrupta</i>	1																	1	9
	<i>Turbonilla hemphilli</i>																		11	
	<i>Turbonilla sp.</i>																		2	
	<i>Cyclostremella humilis</i>																		3	

GALVESTON BAY [G]

130

		Stations																	
		1	7	9	16	18	21	34	42	44	54	70	75	77					
Class Bivalvia																			
Family Nuculanidae																			
	<i>Nuculana concentrica</i>				/ 1	/ 1				/ 2									
	<i>Nuculana acuta</i>											/ 1							
Family Arcidae																			
	<i>Anadara transversa</i>				/ 5	/ 18	/ 5			/ 23		/ 7							
	<i>Lunarea ovalis</i>	/ 1			/ 1	/ 2	/ 1			/ 6		/ 1							
Family Noetiidae																			
	<i>Noetia ponderosa</i>				/ 1					/ 1		/ 1							
Family Mytilidae																			
	<i>Brachidontes exustus</i>					/ 1							/ 1						
	<i>Ischadium recurvum</i>	/ 2																	
	<i>Amygdalum papyria</i>																		
Family Anomiidae																			
	<i>Anomia simplex</i>			/ 1															
Family Ostreidae																			
	<i>Crassostrea virginica</i>	/ 1		/ 1								/ 3							
	<i>Ostrea equestris</i>	/ 2		/ 2	/ 10	/ 8	/ 1			/ 98		/ 4							

Live  
Dead

# GALVESTON BAY [G]

131

		Stations															Total		
		111	137	142	181	195	238	279	281	283	303	311	352	391					
Class Bivalvia																			
Family Nuculanidae																			
	<i>Nuculana concentrica</i>																	4	
	<i>Nuculana acuta</i>																	1	
Family Arcidae																			
	<i>Anadara transversa</i>																	58	
	<i>Lunarca ovalis</i>						1											13	
Family Noetiidae																			
	<i>Noetia ponderosa</i>																	3	
Family Mytilidae																			
	<i>Brachidontes exustus</i>			4														6	
	<i>Ischadium recurvum</i>	3	8	1		7	17											10	28
	<i>Amygdalum papyria</i>					2												2	
Family Anomiidae																			
	<i>Anomia simplex</i>																	1	
Family Ostreidae																			
	<i>Crassostrea virginica</i>		5	1		3	1			2								17	
	<i>Ostrea equestris</i>												1					126	

131

Live  
Dead

GALVESTON BAY [G]

		Stations															
		1	7	9	16	18	21	34	42	44	54	70	75	77			
Family Lucinidae																	
<i>Linga amiantus</i>										1							
Family Ungulinidae																	
<i>Diplodonta semiaspera</i>					1												
Family Kellidae																	
<i>Aligena texasiana</i>					1												
Family Montacutidae																	
<i>Mysella planulata</i>		1		2	1		1							1			
132	Family Sportellidae																
	<i>Ensitellops</i> sp.				1												
	Family Crassatellidae																
<i>Crassinella lunulata</i>				1	3	7	1		1	12							
Family Cardiidae																	
<i>Trachycardium muricatum</i>							1										
<i>Laevicadium mortoni</i>		1															
Family Mactridae																	
<i>Mulinia lateralis</i>		15		1	1	65	89	2	14	5	17	1	3	2	4	11	
<i>Rangia cuneata</i>																	

## GALVESTON BAY [G]

## Stations

111 137 142 181 195 238 279 281 283 303 311 352 391

Total

[illegible]

133

GALVESTON BAY [G]

		Stations															
		1	7	9	16	18	21	34	42	44	54	70	75	77			
Family Tellinidae																	
	<i>Tellina texana</i>											1					
	<i>Tellina versicolor</i>				1												
	<i>Tellina iris</i>					6	4										
	<i>Macoma mitchelli</i>																
	<i>Macoma tenta</i>											1					
Family Donacidae																	
	<i>Donax texasianus</i>				7												
	<i>Donax variabilis</i>					4						1					
	<i>Donax</i> sp.						1			18							
Family Semelidae																	
	<i>Semele proficua</i>			1		1											
	<i>Semele purpurescens</i>				1	1											
	<i>Abra aequalis</i>			1	1	1	9	2		5		1	1		1		
	<i>Cumingia tellinoides</i>		1														
Family Solecurtidae																	
	<i>Tagelus divisus</i>																
	<i>Tagelus plebeius</i>																

134

GALVESTON BAY [G]

		Stations															Total	
		111	137	142	181	195	238	279	281	283	303	311	352	391				
Family Tellinidae																		
	<i>Tellina texana</i>			/1				/1									2	/1
	<i>Tellina versicolor</i>																	/1
	<i>Tellina iris</i>																6	/4
	<i>Macoma mitchelli</i>		/2		/6		/1			/2	/1			/1			9	/8
	<i>Macoma tenta</i>																	/1
Family Donacidae																		
	<i>Donax texasianus</i>																	/7
	<i>Donax variabilis</i>																	/5
	<i>Donax sp.</i>																	/19
Family Semelidae																		
	<i>Semele proficua</i>																	/2
	<i>Semele purpurescens</i>																	/1
	<i>Abra aequalis</i>																2	/20
	<i>Cumingia tellinoides</i>																	/1
Family Solecurtidae																		
	<i>Tagelus divisus</i>										/1							/1
	<i>Tagelus plebeius</i>		/4		/1												1	/4

135

Live  
Dead

GALVESTON BAY [G]

136

		Stations														Total
		1	7	9	16	18	21	34	42	44	54	70	75	77		
Family Dreissenidae																
<i>Mytilopsis leucophaeta</i>																
Family Veneridae																
<i>Dosinia discus</i>				1			1			1		1				
<i>Chione cancellata</i>				1		1	1									
<i>Mercenaria campechiensis</i>										2		1				
Family Petricolidae																
<i>Petricola pholadiformis</i>				1		18	1			5						
<i>Rupellaria</i> sp.		1				4	5			3						
Family Corbulidae																
<i>Corbula contracta</i>												2				
<i>Corbula dietziana</i>						3										
<i>Corbula cymella</i>										1						
<i>Corbula</i> sp.					1					3						
Family Pholadidae																
<i>Cyrtopleura costata</i>										1						
<i>Diplothyra smithi</i>										2						
Family Pandoridae																
<i>Pandora trilineata</i>				1		1										

136

Live  
Dead



GALVESTON BAY [G]

137

		Stations														Total	
		111	137	142	181	195	238	279	281	283	303	311	352	391			
Family Dreissenidae																	
<i>Mytilopsis leucophaeta</i>						6						1				7	
Family Veneridae																	
<i>Dosinia discus</i>																4	
<i>Chione cancellata</i>															1	2	
<i>Mercenaria campechiensis</i>																3	
Family Petricolidae																	
<i>Petricola pholadiformis</i>															25	12	
<i>Rupellaria</i> sp.																1	
Family Corbulidae																	
<i>Corbula contracta</i>																2	
<i>Corbula dietziana</i>																3	
<i>Corbula cymella</i>																1	
<i>Corbula</i> sp.																4	
Family Pholadidae																	
<i>Cyrtopleura costata</i>																1	
<i>Diplothyra smithi</i>															2		
Family Pandoridae																	
<i>Pandora trilineata</i>															1	2	

Live

GALVESTON BAY [G]

## Stations

1 7 9 16 18 21 34 42 44 54 70 75 77

Total

[illegible]

Live  
Dead

GALVESTON BAY [G]

## Stations

111 137 142 181 195 238 279 281 283 303 311 352 391

Total

[illegible]

139

GALVESTON BAY

		Stations																		Total
		1	7	9	16	21	34	42	44	54	70	75	111	137	195	283	303	352		
141	Class Crustacea																			
	Order Harpacticoida																			
	Harpacticoid copepod*					1														
	Order Cumacea																			
	<i>Cyclaspis varians</i>								2		1								2	
	<i>Oxyurostylis salinoi</i>					1													1	
	Order Tanaidacea																			
	<i>Leptochelia rapax</i>													3					3	
	Order Isopoda																			
	<i>Cassidinidea lunifrons</i>	1													3				3	
	<i>Xenanthuca brevitelson</i>											5		1					6	
	Order Amphipoda																			
	Family Ampeliscidae																			
	<i>Ampelisca</i> sp.												3						3	
	Family Corophiidae																			
	<i>Corophium louisianum</i>														3	3			6	
	Family Liljeborgiidae																			
	<i>Listriella</i> n. sp.			2																2

\*unidentified

GALVESTON BAY

## Stations

	1	7	9	16	21	34	42	44	54	70	75	111	137	195	283	303	352	Total
Family Melitidae																		
<i>Melita nitida</i>	3														2			5
Family Haustoriidae																		
<i>Lepidactylus n. sp.</i>																	2	2
Order Decapoda																		
Family Sergestidae																		
<i>Acetes americanus</i>		3		1			1											5
Family Xanthidae																		
<i>Menippe mercenaria</i>								3										3
<i>Rhithropanopeus harrisi</i>														3				1
<i>Pilumnus sp.</i>																1		1
Family Paguridae																		
<i>Clibanarius vittatus</i>						1												1
Family Pinnotheridae																		
<i>Pinnixa sayana</i>									1							1		2
TOTAL	4	3	2	1	1	1	1	5	1	1	5	3	4	9	5	2	2	50
number of individuals / number of species	2	1	1	1	1	1	1	2	1	1	1	1	1	3	2	2	1	23

## GALVESTON BAY

Stations

1 7 9 16 18 21 34 42 44 54 70 75 77

Phylum Annelida																			
Class Polychaeta																			
Family Capitellidae																			
<i>Mediomastus californiensis</i>	16		1				1		2			1							
<i>Capitella capitata</i>																			
Family Nereidae																			
<i>Nereis succinea</i>	4						2		1		1								
Family Orbiniidae											1								
<i>Haploscoloplos fragilis</i>		1										4							
<i>Haploscoloplos</i> sp.																			
Family Eunicidae																			
<i>Marphysa</i> sp. "A"	9																		
Family Pilargiidae																			
<i>Sigambra tentaculata</i>		1																	
<i>Parandalia fauveli</i>											1	1	1						
Family Cossuridae																			
<i>Cossura delta</i>		1																	
Family Lumbrineridae																			
<i>Clymenella torquata</i>			4																

## GALVESTON BAY

Stations

	111	137	142	181	195	238	279	281	283	303	311	352	391						Total
Phylum Annelida																			
Class Polychaeta																			
Family Capitellidae																			
<i>Mediomastus californiensis</i>		5	3							1	42								72
<i>Capitella capitata</i>			1																1
Family Nereidae																			
<i>Nereis succinea</i>			1		22														31
Family Orbiniidae																			1
<i>Haploscoloplos fragilis</i>				11															16
<i>Haploscoloplos</i> sp.		6																	6
Family Eunicidae																			
<i>Marphysa</i> sp. "A"																			9
Family Pilargiidae																			
<i>Sigambra tentaculata</i>																			1
<i>Parandalia fauveli</i>		1		2		5			2	2									15
Family Cossuridae																			
<i>Cossura delta</i>	1																		2
Family Lumbrineridae																			
<i>Clymenella torquata</i>																			4

GALVESTON BAY

## Stations

1 7 9 16 18 21 34 42 44 54 70 75 77

[illegible]



GALVESTON BAY

Stations

	111	137	142	181	195	238	279	281	283	303	311	352	391	Total	
Family Spionidae									1						
<i>Paraprionospio pinnata</i>	1		2						1					12	
<i>Spiophanes bombyx</i>						1								1	
<i>Polydora sp.</i>						2								2	
<i>Polydora websteri</i>					15									15	
<i>Streblospio benedicti</i>		1	7						2		28			40	
<i>Scoelelepis sp.</i>														1	
<i>Apoprionospio pygmaea</i>														1	
Family Onuphidae															
<i>Diopatra cuprea</i>														2	
<i>Onuphis emerita</i>														1	
Family Oweniidae															
<i>Owenia fusiformis</i>					1									2	
Family Phyllodocidae														1	
Family Cirratulidae															
<i>Tharyx marioni</i>														1	
<i>Tharyx sp.</i>														1	

GALVESTON BAY

## Stations

[illegible]

GALVESTON BAY

## Stations

111 137 142 181 195 238 279 281 283 303 311 352 391

Total

[illegible]

147

# GALVESTON BAY

Stations

1 7 9 16 18 21 34 42 44 54 70 75 77

Phylum Nemertinea																			
Nemerteans (unidentified)		1		2															
Phylum Cnidaria																			
Class Anthozoa										5									
Phylum Platyhelminthes																			
Class Polycladida																			
Phylum Hemichordata																			
Class Enteropneusta									1			1		2					
Phylum Chordata																			
Subphylum Cephalochordata																			
<i>Branchiostoma</i> sp.										5									
Total	33	7	16	5	22	13	22	6	33	3	13	14	4						
	5	5	11	5	3	6	7	4	16	3	8	6	3						
Average	no. of individuals = 16.9 no. of species 5.5																		

148

GALVESTON BAY

## Stations

111 137 142 181 195 238 279 281 283 303 311 352 391

Total

[illegible]

149

TRINITY BAY [G]

150

Phylum Mollusca		Stations																		Total
		288	294	326	327	358	365	370	376	416	419	422	425	427	438	448	459			
Class Gastropoda																				
Family Littoridinidae																				
<i>Texadina barretti</i>		3 4		2	1 4	1 8												5 2	6 44	
<i>Texadina sphinctostoma</i>		4	3		4	8		1				12		6	3	2	3			
Family Stenothyridae																				
<i>Vioscalba louisianae</i>												2 1					7		9 1	
Family Calyptraeidae																				
<i>Crepidula plana</i>					1														1	
Family Acteocinidae																				
<i>Acteocina canaliculata</i>						1													1	
Family Pyramidellidae																				
<i>Odostomia cf laevigata</i>										1									1	
<i>Eulimastoma cf weberi</i>		1																	1	
Class Bivalvia																				
Family Ostreidae																				
<i>Crassostrea virginica</i>										1									1	
Family Crassatellidae																				
<i>Crassinella lunulata</i>		1																	1	

TRINITY BAY [G]

## Stations

288 294 326 327 358 365 370 376 416 419 422 425 427 438 448 459      Total

[illegible]

TRINITY BAY [G]

## Stations

Phylum Arthropoda

288 294 326 327 358 365 370 376 416 419 422 425 427 438 448 459      total

Class Crustacea

Order Mysidacea

Mysidopsis almyra

Order Tanaidacea

*Leptochelia rapax*

Order Amphipoda

Family Corophiidae

*Corophium louisianum*

Order Decapoda

Family Xanthidae

*Rhithropanopeus harrisi*

TOTAL	Number of species
	Number of individuals

152



TRINITY BAY [G]

153

	Stations																	Sub-
Phylum Annelida	288	294	326	327	358	365	370	376	416	419	422	425	427	438	448	459	total	
Class Polychaeta																		
Family Capitellidae								2									2	
<i>Mediomastus californiensis</i>	17			3	11												31	
Family Nereidae																		
<i>Nereis succinea</i>													1				1	
<i>Nereis</i> sp.									3				1				4	
Family Spionidae																		
<i>Polydora websteri</i>									2								2	
Family Goniadidae																		
<i>Glycinde</i> sp.	1																1	
Family Pilargiidae																		
<i>Parandalia fauveli</i>		1	2				1					1					5	
Subtotal	18	1	2	3	11	0	1	2	5	0	0	1	2	0	0	0	46	
Phylum Nemertinea																		
Nemerteans (unidentified)				1				1									2	
TOTALS	21	2	6	5	13	0	3	3	7	0	0	4	15	0	3	7	87	
live individuals	3	2	3	3	2		3	2	3			3	6		2	1	20	
live species																		
Average no. of species/stations = 2.0																		

EAST GALVESTON BAY [G]

Phylum Mollusca	Stations																	Total
	63	118	119	127	151	161	198	209	211	220	222	231						
Class Gastropoda																		
Family Littoridinidae																		
<i>Texadina barretti</i>									7		1						7	1
<i>Texadina sphinctostoma</i>			1								1						2	
Family Vitrinellidae																		
<i>Vitrinella floridana</i>			1														1	
Family Vermetidae																		
<i>Vermicularia spirata</i>								1									1	
Family Calyptraeidae																		
<i>Crepidula convexa</i>							1										1	
<i>Crepidula plana</i>							1										1	
Family Naticidae																		
<i>Polinices duplicatus</i>	1																1	
Family Nassariidae																		
<i>Nassarius acutus</i>							2										2	
Family Acteocinidae																		
<i>Acteocina canaliculata</i>	1																1	

154

Live  
Dead

## EAST GALVESTON BAY [G]

Stations

	63	118	119	127	151	161	198	209	211	220	222	231						Total
Family Pyramidellidae																		
<i>Odostomia cf laevigata</i>			1				1	2										1
<i>Eulimastoma cf weberi</i>							1	2										3
Class Bivalvia																		
Family Anomiidae																		
<i>Anomia simplex</i>				1	1													2
Family Ostreidae																		
<i>Crassostrea virginica</i>					5													5
Family Mactridae																		
<i>Mulinia lateralis</i>	1 8	1 1	2 2	20 13	1 1	48 5			1 3	8 3								7 112
<i>Rangia cuneata</i>										2								2
<i>Spisula solidissima similis</i>										1								1
Family Tellinidae																		
<i>Macoma mitchelli</i>				2 3		4 1	8 8	1 8	1 1	5 3	1 1							7 30
Family Solecurtidae																		
<i>Tagelus plebeius</i>										1								1

Live  
Dead

[illegible]

~~Live~~  
~~Dead~~

## EAST GALVESTON BAY [G]

Stations

	63	118	119	127	151	161	198	209	211	220	222	231						Total	
Phylum Arthropoda																			
Class Crustacea																			
Order Mysidacea																			
<i>Mysidopsis almyra</i>								1										1	
<i>Mysidopsis bigelowi</i>											2							2	
<i>Mysidopsis</i> sp.										1								1	
Order Cumacea																			
<i>Oxyurostylis salinoi</i>										1								1	
Order Isopoda																			
<i>Xenanthura brevitelson</i>											7							7	
Order Amphipoda																			
Family Ampeliscidae																			
<i>Ampelisca</i> sp.			2															2	
Family Corphiidae																			
<i>Corophium louisianum</i>		4																4	
Family Oedicerotidae																			
<i>Monoculodes</i> cf. <i>nyei</i>											2							2	

## EAST GALVESTON [G]

## Stations

63 118 119 127 151 161 198 209 211 220 222 231

Total

[illegible]

158

Live  
Head

## Stations

63 118 119 127 151 161 198 209 211 220 222 231

Total

Phylum Annelida																			
Class Polychaeta																			
Family Capitellidae																			
<i>Mediomastus californiensis</i>					1		4			9	1							15	
<i>Capitella capitata</i>										2								2	
Family Spionidae																			
<i>Paraprionospio pinnata</i>			21	1			1		1	1								25	
<i>Streblospio benedicti</i>							4			12								16	
<i>Polydora</i> sp.										1								1	
Family Orbiniidae																			
<i>Haploscoloplos fragilis</i>					1													1	
<i>Haploscoloplos foliosus</i>		1																1	
Family Nereidae																			
Nereid sp.				1														1	
Family Goniadidae																			
<i>Glycinde</i> sp.	1		7															8	
<i>Glycinde nordmanni</i>		8				1												9	
<i>Glycinde solitaria</i>							1											1	

[illegible]



WEST BAY [WG]

		Stations																	
		5	6	15	18	21	25	28	30	44	46	48	52	55	59	60			
191	Phylum Mollusca																		
	Class Gastropoda																		
	Family Littoridinidae																		
	<i>Texadina barretti</i>																		
	<i>Texadina sphinctostoma</i>																		
	Family Vitrinellidae																		
	<i>Vitrinella floridana</i>										/	2							
	<i>Cyclostremiscus suppressus</i>																		
	<i>Teinostoma biscaynense</i>							/	1		/	2							
	<i>Teinostoma lerema</i>																		
	<i>Teinostoma sp.</i>																		
	Family Caecidae																		
	<i>Caecum johnsoni</i>										/	2							
	<i>Caecum pulchellum</i>				/	1					/	2	/	1					
	Family Cerithiidae																		
	<i>Bittium varium</i>				/	11				/	1		/	9		/	18		
	<i>Cerithiopsis greeni</i>																		
	<i>Seila adamsi</i>										/	2							

WEST BAY [WG]

		Stations																	Total
		74	77	80	84	88	93	97	101	111	117	122	126	127	129				
162	Phylum Mollusca																		
	Class Gastropoda																		
	Family Littoridinidae																		
	<i>Texadina barretti</i>		1	4	5	6												6	10
	<i>Texadina sphinctostoma</i>				6		2							1				9	
	Family Vitrinellidae																		
	<i>Vitrinella floridana</i>													2				4	
	<i>Cyclostremiscus suppressus</i>													1				1	
	<i>Teinostoma biscaynerse</i>						1							1				5	
	<i>Teinostoma lerema</i>						1											1	
	<i>Teinostoma</i> sp.				1													1	
	Family Caecidae																		
	<i>Caecum johnsoni</i>																	2	
	<i>Caecum pulchellum</i>													1				4	
	Family Cerithiidae																		
	<i>Bittium varium</i>								1					9				13	1
	<i>Cerithiopsis greeni</i>								1									1	
	<i>Seila adamsi</i>																	2	

Live

## WEST BAY [WG]

Stations

5 6 15 18 21 25 28 30 44 46 48 52 55 59 60

Family Triphoridae																			
<i>Triphora perversa nigrocinta</i>																			
Family Epitoniidae																			
<i>Epitonium multistriatum</i>																			
Family Calyptraeidae																			
<i>Crepidula convexa</i>																			
<i>Crepidula fornicata</i>													1	1					
<i>Crepidula plana</i>			1	2	10	1		1	7			18	2		1				
Family Naticidae																			
<i>Polinices duplicatus</i>						1													
<i>Natica pusilla</i>																			
Family Turridae																			
<i>Pyrgocythara plicosa</i>				1								2							
Family Nassariidae																			
<i>Nassarius acutus</i>							2												
Family Columbellidae																			
<i>Parvanachis obesa</i>																			
<i>Parvanachis ostreicola</i>						2							3						
<i>Mitrella lunata</i>																			

163

Live
Dead

WEST BAY [WG]

		Stations																		Total
		74	77	80	84	88	93	97	101	111	117	122	126	127	129					
Family Triphoridae																				
	<i>Triphora perversa nigrocincta</i>													2					2	
Family Epitoniidae																				
	<i>Epitonium multistriatum</i>						1												1	
Family Calyptraeidae																				
	<i>Crepidula convexa</i>						1												1	
	<i>Crepidula fornicata</i>																		2	
	<i>Crepidula plana</i>						1				1			3				3	45	
Family Naticidae																				
	<i>Polinices duplicatus</i>						1				2			1	2				2	9
	<i>Natica pusilla</i>								2										2	
Family Turridae																				
	<i>Pyrgocythara plicosa</i>						1						1	3					8	
Family Nassariidae																				
	<i>Nassarius acutus</i>						8	2	3	2									17	
Family Columbellidae																				
	<i>Parvanachis obesa</i>						1							1					1	
	<i>Parvanachis ostreicola</i>						6		1	1		3							13	
	<i>Mitrella lunata</i>													6					9	

Live

## WEST BAY [WG]

Stations

5 6 15 18 21 25 28 30 44 46 48 52 55 59 60

Family Acteonidae																				
<i>Acteon punctostriatus</i>			2		5	2	1	3	3		4	1	1	2	2	10	4			
Family Acteocinidae																				
<i>Acteocina canaliculata</i>			5	6	2	7	2	2	6	4	7	3	3	10	4	3	4	5		
			15	12	12	8	18	1		78										
Family Pyramidellidae																				
<i>Odostomia cf gibbosa</i>				1		1														
<i>Odostomia cf laevigata</i>			1									2								
<i>Odostomia seminuda</i>			2	1						4										
<i>Odostomia impressa</i>			1	5	1					2										
<i>Odostima cf emeryi</i>																2				
<i>Sayella cf livida</i>			1									1								
<i>Eulimastomia cf weberi</i>				1	4					14										
<i>Eulimastomia cf teres</i>			2				5		1			1	1		4	1				
<i>Eulimastomia sp.</i>										2										
<i>Turbonilla cf interrupta</i>			3		2	2	8			4	66	3	2				1			
<i>Turbonilla cf hemphilli</i>										4										
<i>Turbonilla cf aequalis</i>							6													
<i>Cyclostremella humilis</i>										2										

165

Live
Dead

## WEST BAY [WG]

		Stations																		Total
		74	77	80	84	88	93	97	101	111	117	122	126	127	129					
Family Acteonidae																				
	<i>Acteon punctostriatus</i>						3				1		1	2	30	1			20	58
Family Acteocinidae																				
	<i>Acteocina canaliculata</i>	1				2	15 44	3 4		1 2			2	1	3				69	223
Family Pyramidellidae																				
	<i>Odostomia cf gibbosa</i>						1												3	
	<i>Odostomia cf laevigata</i>						2							4					9	
	<i>Odostomia seminuda</i>																	2	5	
991	<i>Odostomia impressa</i>	1					1			1								1	11	
	<i>Odostima cf emeryi</i>																		2	
	<i>Sayella cf livida</i>																		2	
	<i>Eulimastomia cf weberi</i>				6		2												27	
	<i>Eulimastomia cf teres</i>						2	1 2		3				2				6	19	
	<i>Eulimastomia sp.</i>						1											1	2	
	<i>Turbonilla cf interrupta</i>						6 117	1 1			1			3 69				14	275	
	<i>Turbonilla cf hemphilli</i>						2 31			1		1						2	37	
	<i>Turbonilla cf aequalis</i>							1						12					19	
	<i>Cyclostremella humilis</i>																		2	

WEST BAY [WG]

		Stations																
		5	6	15	18	21	25	28	30	44	46	48	52	55	59	60		
Class Bivalvia																		
Family Nuculanidae																		
	<i>Nuculana acuta</i>							2 1			2							
	<i>Nuculana concentrica</i>							1			2					2		
Family Arcidae																		
	<i>Anadara transversa</i>			1							2							
	<i>Lunarca ovalis</i>																	
Family Mytilidae																		
167	<i>Brachidontes exustus</i>											1						
	<i>Ischadium recurvus</i>																	
	<i>Amygdalum papyria</i>						1											
Family Pectinidae																		
	<i>Argopecten i. amplicostatus</i>																	
Family Anomiidae																		
	<i>Anomia simplex</i>								1		1							
Family Ostreidae																		
	<i>Crassostrea virginica</i>					1					1							
	<i>Ostrea equestris</i>			8	1			1			20							

## WEST BAY [WG]

## Stations

74 77 80 84 88 93 97 101 111 117 122 126 127 129

Total

[illegible]

168



WEST BAY [WG]

## Stations

5 6 15 18 21 25 28 30 44 46 48 52 55 59 60

[illegible]

## WEST BAY [WG]

		Stations																	Total
		74	77	80	84	88	93	97	101	111	117	122	126	127	129				
170	Family Lucinidae																		
	<i>Linga amiantus</i>							1											1
	Family Ungulinidae																		
	<i>Diplodonta cf soror</i>																		1
	Family Kellidae																		
	<i>Aligena texasiana</i>						2	34	1				40	35	1				42
	Family Montacutidae																		
	<i>Myrella planulata</i>		1				13	40	2	1	3	1	28	83					59
	Family Sportellidae																		
	<i>Ensitellops sp.</i>																		1
	Family Crassatellidae																		
	<i>Crassinella lunulata</i>							1	1	2	1								6
	Family Cardiidae																		
	<i>Laevicardium mortoni</i>											4	1						4
	Family Mactridae																		
	<i>Mulinia lateralis</i>	3	21	4	5	2	12	9	8	6	3	7	3	4	5				368
	<i>Rangia flexuosa</i>			1			136	2	67	3	7	1	25	4					1
	Family Cultellidae																		
	<i>Ensis minor</i>		1																25

Live
Dead

WEST BAY [WG]

Stations

5 6 15 18 21 25 28 30 44 46 48 52 55 59 60

Family Tellinidae																				
<i>Tellina texana</i>				1																
<i>Tellina sp.</i>				1								2								
<i>Macoma tenta</i>																1				
<i>Macoma mitchelli</i>					2			1												
Family Donacidae																				
<i>Donax variabilis</i>																				
Family Semelidae																				
<i>Semele proficua</i>											2									
<i>Abra aequalis</i>											3									
<i>Curvingia tellinoides</i>			2	4							2									
Family Solecurtidae																				
<i>Tagelus divisus</i>			1		1						1									
<i>Tagelus plebeius</i>				1	7	1		1				2		2						
Family Dreissenidae																				
<i>Mytilopsis leucophaeta</i>																				

171

Live

WEST BAY [WG]

		Stations																Total	
		74	77	80	84	88	93	97	101	111	117	122	126	127	129				
Family Tellinidae																			
	<i>Tellina texana</i>						1	1						1				1	4
	<i>Tellina sp.</i>								1									2	2
	<i>Macoma tenta</i>																	1	
	<i>Macoma mitchelli</i>	2		4	5													9	18
Family Donacidae																			
	<i>Donax variabilis</i>								26									26	
Family Semelidae																			
172	<i>Semele proficua</i>																	2	
	<i>Abra aequalis</i>						2	10		1	1	1		1	2			4	17
	<i>Cummingia tellinoides</i>																	2	6
Family Solecurtidae																			
	<i>Tagelus divisus</i>							14						4	7			4	24
	<i>Tagelus plebeius</i>		1								1								16
Family Dreissenidae																			
	<i>Mytilopsis leucophaeta</i>				2														2

Live  
Dead

WEST BAY [WG]

Stations

5 6 15 18 21 25 28 30 44 46 48 52 55 59 60

Family Veneridae																				
<i>Dosinia discus</i>			1																	
<i>Cyclinella tenuis</i>																				
<i>Chione cancellata</i>						1	1					1								
<i>Mercenaria campechiensis</i>						1				1	4									
<i>Anomalocardia auberiana</i>																2				
Family Petricolidae																				
<i>Petricola pholadiformis</i>													1							
Family Myidae																				
<i>Paramya subovata</i>			1																	
Family Corbulidae																				
<i>Corbula dietziana</i>																				
<i>Corbula swiftiana</i>																				
<i>Corbula sp.</i>																				
Family Pholadidae																				
<i>Diplothyra smithi</i>			1	1																
Family Pandoridae																				
<i>Pandora trilineata</i>			1													1	1			

173

Live  
Dead

WEST BAY [WG]

Stations

	74	77	80	84	88	93	97	101	111	117	122	126	127	129	Total
Family Veneridae															
<i>Dosinia discus</i>						1 1									1 2
<i>Cyclinella tenuis</i>						1									1
<i>Chione cancellata</i>												1 4			1 6
<i>Mercenaria campechiensis</i>						1									1 6
<i>Anomalocardia auberiana</i>															2
Family Petricolidae															
<i>Petricola pholadiformis</i>															1
Family Myidae															
<i>Paramya subovata</i>															1
Family Corbulidae															
<i>Corbula dietziana</i>												2			2
<i>Corbula swiftiana</i>						1 3	2					3			1 8
<i>Corbula sp.</i>						1									1
Family Pholadidae															
<i>Diplothyra smithi</i>															1 1
Family Pandoridae															
<i>Pandora trilineata</i>						4 9			2			1 3			5 17

174

Live

175

		Stations																			
		5	6	15	18	21	25	28	30	44	46	48	52	55	59	60					
Family Lyonsiidae																					
<i>Lyonsia hyalina floridana</i>				42 1	46 1	8	29 1	10			52		1		3						
Family Periplomatidae																					
<i>Periploma margaritaceum</i>									1 2			7 1		6 3	2 1						
Class Scaphopoda																					
Family Dentalidae																					
<i>Dentalium texasianum</i>																					
Total	Live individuals		15	60	64	19	102	81	14	9	46	17	21	19	38	47					
	Dead individuals	1	8	101	83	162	50	172	67	27	375	20	80	108	134	25					
Total number of live species		0	6	10	6	5	8	7	3	2	7	5	6	3	8	1					

[illegible]

☒ Live



WEST GALVESTON

## Stations

5    6   15   18   21   25   28   30   44   46   48   55

[illegible]

177

## WEST GALVESTON

Stations

59 60 77 88 93 101 111 117 122 126 127 129

Total

Class Crustacea																			
Subclass Ostracoda																			
Ostracods*																			
Order Harpacticoida																			
Harpacticoid copepods*						2	1												
Order Mysidacea																			
<i>Bowmaniella</i> cf <i>dissimilis</i>												3						3	
<i>Mysidopsis bigelowi</i>												5						5	
Order Cumacea																			
<i>Cyclaspis varians</i>			2															4	
<i>Eudorella monodon</i>				3														3	
<i>Oxyurostylis salinoi</i>	2								3									25	
Cumacean A*							1											1	
Order Apseudidea																			
<i>Apseudes</i> sp.							1											1	
Order Tanaidacea																			
<i>Leptochelia rapax</i>																		7	

## WEST GALVESTON

Stations

5 6 15 18 21 25 28 30 44 46 48 55

Order Isopoda																			
<i>Ancinus depressus</i>																			
<i>Cassidinidea lunifrons</i>																			
<i>Edotea montosa</i>						1													
<i>Erichsonella filiformis isabelensis</i>																			
<i>Xenanthura brevitelson</i>				1															
Order Amphipoda																			
Family Ampeliscidae																			
<i>Ampelisca abdita</i>	7	166	7					4											
<i>Ampelisca brevisimulata</i>						2		5			5	8							
<i>Ampelisca vadorum</i>					68	17				2									
<i>Ampelisca sp.</i>				1															
Family Ampithoidae																			
<i>Ampithoe sp.</i>																			
Family Corophiidae																			
<i>Cerapus tubularis</i>					13														
<i>Corophium acherusieum</i>		9			1	1													
<i>Corophium louisianum</i>	12			8															
<i>Corophium sp.</i>																			

## WEST GALVESTON

Stations																		Total
	59	60	77	88	93	101	111	117	122	126	127	129						
Order Isopoda																		
<i>Ancinus depressus</i>							3											3
<i>Cassidinidea lunifrons</i>									2									2
<i>Edotea montosa</i>										3								4
<i>Erichsonella filiformis isabelensis</i>										2								2
<i>Xenanthura brevitelson</i>	1						1	1				1						5
Order Amphipoda																		
Family Ampeliscidae																		
<i>Ampelisca abdita</i>	7																	191
<i>Ampelisca brevisimulata</i>							6					1						27
<i>Ampelisca vadorum</i>										28								115
<i>Ampelisca</i> sp.			1					1		2								5
Family Ampithoidae																		
<i>Ampithoe</i> sp.										46								46
Family Corophiidae																		
<i>Cerapus tubularis</i>										14								27
<i>Corophium acherusieum</i>																		11
<i>Corophium louisianum</i>																		20
<i>Corophium</i> sp.										2								2

WEST GALVESTON

## Stations

5    6   15   18   21   25   28   30   44   46   48   55

[illegible]

181

## WEST GALVESTON

	Stations													Total
	59	60	77	88	93	101	111	117	122	126	127	129		
Family Aoridae														
<i>Grandidierella bonnieroides</i>								1	8					30
Family Haustoriidae														
<i>Acanthohaustorius n. sp.</i>	1					52								55
Family Liljeborgiidae														
<i>Listriella n. sp.</i>					2			4		4				13
Family Melitidae														
<i>Melita nitida</i>									5					7
Family Oedicerotidae														
<i>Monoculodes cf nyei</i>			1			7					1			22
<i>Synchelidium americanum</i>														3
Family Pontogeneiidae														
<i>Pontogeneia bartschi</i>														1
Suborder Caprellidea*														2
Order Decapoda														
Family Sergestidae														
<i>Acetes americanus</i>												1		2

# WEST GALVESTON

Stations

5 6 15 18 21 25 28 30 44 46 48 55

Family Xanthidae																			
<i>Pilumnus sp.</i>																			
<i>Rhithropanopeus harrisi</i>																			
Family Portunidae																			
<i>Callinectes sapidus</i>																			
Family Pinnotheridae																			
<i>Pinnotheres ostreum</i>																			
Family Diogenidae																			
<i>Paguristes sp.</i>																			
Brachyuran zoea*																			
TOTAL	4	6	3	6	7	7	1	5	1	4	4	3							
Number of species	22	180	30	13	91	32	2	12	2	6	17	10							
Number of individuals																			
Totals do not include unidentified																			
specimens.																			

\*unidentified

WEST GALVESTON

		Stations														Total	
		59	60	77	88	93	101	111	117	122	126	127	129				
Family Xanthidae																	
	<i>Pilumnus</i> sp.							1								1	
	<i>Rhithropanopeus harrisi</i>			1						6						7	
Family Portunidae																	
	<i>Callinectes sapidus</i>		1				1				1					3	
Family Pinnotheridae																	
	<i>Pinnotheres ostreum</i>									2						2	
Family Diogenidae																	
	<i>Paguristes</i> sp.									1						1	
	Brachyuran zoea*							1									
TOTAL	Number of species	3	3	3	1	1	6	6	4	10	3	4	5			100	
	Number of individuals	4	10	3	3	2	66	12	7	111	7	6	16			664	
Totals do not include unidentified																	
specimens.																	

\*unidentified



## WEST GALVESTON BAY

	Stations																		
	5	6	15	18	21	25	28	30	44	46	48	52	55	59	60	74	77	80	84
Phylum Annelida																			
Class Polychaeta																			
Family Polynoidae																			
<i>Harmothoe trimaculata</i>										2									
<i>Alentia sp.</i>			1																
Family Phyllodocidae			1														1		
<i>Phyllodoce castanea</i>							1			2									
Family Pilargiidae																			
<i>Sigambra tentaculata</i>																			
<i>Parandalia fauveli</i>																		1	1
Family Hesionidae			6																
<i>Gyptis vittata</i>			1		1									1					
Family Syllidae																			
<i>Brania sp.</i>																			
<i>Syllis cf cornuta</i>			3																
Family Nereidae																			
<i>Nereis succinea</i>																			
<i>Nereis sp.</i>			1																

## WEST GALVESTON BAY

Stations

88 93 97 101 111 117 122 126 127 129 Total

Phylum Annelida																			
Class Polychaeta																			
Family Polynoidae																			
<i>Harmothoe trimaculata</i>																2			
<i>Alentia</i> sp.																1			
Family Phyllodocidae										1						3			
<i>Phyllodoce castanea</i>								2								5			
Family Pilargiidae																			
<i>Sigambra tentaculata</i>						1										1			
<i>Parandalia fauveli</i>																2			
Family Hesionidae						1										7			
<i>Gyptis vittata</i>	2	1						1		2						9			
Family Syllidae																			
<i>Brania</i> sp.					1											1			
<i>Syllis</i> cf <i>cornuta</i>																3			
Family Nereidae																			
<i>Nereis succinea</i>								2	3	6	1					12			
<i>Nereis</i> sp.																1			

[illegible]

88

93

97

101

111

117

122

126

127

129

Total

Family Glyceridae											1									
Family Goniadidae											14									
<i>Glycinde nordmanni</i>			2								29									
<i>Glycinde sp.</i>		1				6					13									
Family Onuphidae																				
<i>Diopatra cuprea</i>			1								6									
Family Lumbrineridae																				
<i>Lumbrineris tenuis</i>					2					1	3									
<i>Clymenella torquata</i>		5				8			38		59									
Family Terebellidae																				
<i>Pista sp.</i>											1									
Family Serpulidae																				
<i>Hydroides sp.</i>						1					1									
Family Magelonidae																				
<i>Magelona sp. "C"</i>				2							2									
Family Chaetopteridae																				
<i>Spiochaetopterus oculatus</i>											3									
<i>Spiochaetopterus sp.</i>											6									

# WEST GALVESTON BAY

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	Stations																		
	5	6	15	18	21	25	28	30	44	46	48	52	55	59	60	74	77	80	84
Family Cirratulidae																			
<i>Tharyx</i> sp.			1		2														
Family Cossuridae																			
<i>Cossura delta</i>	2	3													1				
Family Orbiniidae																			
<i>Haploscoloplos fragilis</i>	1			5	3	2			1		36		21	17			21		2
<i>Scoloplos</i> sp.																			
Family Paraonidae																			
<i>Aricidea</i> cf <i>fragilis</i>						1				2	109								
<i>Aricidea taylori</i>																			
<i>Aricidea</i> sp.			3																
Family Capitellidae	1													3	1				
<i>Capitella capitata</i>						34					10						1		
<i>Mediomastus californiensis</i>			35	4	3					7			4						
Family Arabellidae																			
<i>Drilonereis</i> cf <i>longa</i>			1																
Family Oweniidae																			
<i>Owenia fusiformis</i>											3								

WEST GALVESTON BAY

## Stations

88	93	97	101	111	117	122	126	127	129	Total
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[illegible]

190

# WEST GALVESTON BAY

Stations

5 6 15 18 21 25 28 30 44 46 48 52 55 59 60 74 77 80 84

Family Ampharetidae																		
<i>Melinna maculata</i>			1		1	1				4								
<i>Amphicteus sp.</i>														1				
Family Spionidae																		
<i>Streblospio benedicti</i>																		
<i>Paraprionospio pinnata</i>	4	2			1		3			1	1				7			2
<i>Scoelelepis texana</i>							1	1					61				3	
<i>Polydora sp.</i>			1															
Family Sabellidae																		
<i>Chone americana</i>			2	2														
<i>Megalomma sp.</i>																		
<i>Megalomma bioculatum</i>			2															
<i>Potamilla reniformis</i>	1		1										1					
SUBTOTAL	11	8	70	17	14	57	8	1	1	23	162		88	27	15	1	27	1
number of individuals	6	3	17	5	9	7	6	1	1	8	7		5	5	6	1	5	1
number of species																		4
Average number of species/station=5.36																		
Phylum Cnidaria																		
Order Actiniaria		8																

# WEST GALVESTON BAY

Stations

	88	93	97	101	111	117	122	126	127	129	Total								
Family Ampharetidae																			
<i>Melinna maculata</i>	1					1					9								
<i>Amphicteus sp.</i>											1								
Family Spionidae																			
<i>Streblospio benedicti</i>								30			30								
<i>Paraprionospio pinnata</i>	2	7	5		2	1	1		3		42								
<i>Scoelelepis texana</i>											66								
<i>Polydora sp.</i>											1								
Family Sabellidae		1									1								
<i>Chone americana</i>								13	1		18								
<i>Megalomma sp.</i>						1					1								
<i>Megalomma bioculatum</i>											2								
<i>Potamilla reniformis</i>			1					1			5								
SUBTOTAL	7	16	9	3	10	24	7	65	58	9	747								
number of individuals	4	6	4	2	7	8	4	7	8	3	150								
number of species																			
Average number of species/station=5.36																			
Phylum Cnidaria																			
Order Actiniaria											8								

192



# WEST GALVESTON BAY

Stations

5 6 15 18 21 25 28 30 44 46 48 52 55 59 60 74 77 80 84

193

Phylum Echinodermata																			
Class Ophiuroidea																			
<i>Amphiodia pulchella</i>			1							1									
Phylum Nemertinea																			
Nemerteans (unidentified)																			
Phylum Sipunculida																			
<i>Phascolion strombii</i>						1													
Phylum Chordata																			
Subphylum Vertebrata																			
Class Pisces																			
Family Syngnathidae																			
<i>Hippocampus sp.</i>																			
Totals	33	29	169	94	124	192	91	24	12	179	197	21	117	69	72	1	34	5	23
	10	15	32	17	21	17	14	9	4	12	17	6	11	11	10	1	10	2	8
Average																			

$$\frac{\text{live individuals}}{\text{live species}} = \frac{76.7}{12.6}$$

# WEST GALVESTON BAY

Stations

88 93 97 101 111 117 122 126 127 129 Total

Phylum Echinodermata																			
Class Ophiuroidea																			
<i>Amphiodia pulchella</i>																		2	
Phylum Nemertinea																			
<i>Nemertean</i> (unidentified)	1																	1	
Phylum Sipunculida																			
<i>Phascolion strombii</i>																		1	
Phylum Chordata																			
Subphylum Vertebrata																			
Class Pisces																			
Family Syngnathidae																			
<i>Hippocampus sp.</i>									1									1	
Totals	13	83	26	69	32	53	118	85	118	140	222	3							
live individuals	7	22	11	8	12	14	14	17	23	10	365								
live species																			
Average																			
live individuals																			
live species																			
=																			
76.7																			
12.6																			

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## LITERATURE CITED

- Calnan, Thomas R., (in press), Molluscan distribution in Copano Bay, Texas: The University of Texas at Austin, Bureau of Economic Geology.
- Holland, J. S., Maciolek, Nancy J., and Oppenheimer, C. H., 1973, Galveston Bay benthic community structure as an indicator of water quality: Contributions in Marine Science, v. 17, p. 169-188.
- Jackson, M. L., 1958, Soil chemical analysis: Prentice Hall New Jersey, 498 p.
- Lankford, Robert and Rogers, John, 1969, Holocene geology of the Galveston Bay area: Houston Geological Society, 141 p.
- Martinez, Rudy, 1966, Coastal hydrographic and meteorological study, coastal fisheries project report, Texas: Texas Parks and Wildlife Department, Project No. MH-R-1, Job No. 8, 44 p.
- Martinez, Rudy, 1967, Coastal hydrographic and meteorological study, coastal fisheries project report, Texas: Texas Parks and Wildlife Department, Project No. MH-R-3, Job No. 8, 35 p.
- Martinez, Rudy, 1968, Coastal hydrographic and meteorological study, coastal fisheries project report, Texas: Texas Parks and Wildlife Department, Project No. MH-R-4, Job No. 8, 39 p.
- Martinez, Rudy, 1971, Coastal hydrographic and meteorological study, coastal fisheries project report, Texas: Texas Parks and Wildlife Department, Project No. CH-2-1, Job No. 8, 54 p.
- McKinney, L. D., 1977, The origin and distribution of shallow water gammaridean Amphipoda in the Gulf of Mexico and Caribbean Sea with notes on their Ecology: Texas Agricultural and Mechanical University, College Station, Texas, Doctoral dissertation, 401 p.
- Texas Department of Water Resources, 1979, Galveston-Trinity Bay Estuary: An analysis of bay segment boundaries, physical characteristics, and nutrient processes: Engineering and environmental system section, 95 p.
- Texas Parks and Wildlife Department Comprehensive Planning Branch, 1975, Regional environmental analysis of the Houston-Galveston region: Texas Parks and Wildlife Department, Austin, Texas.
- Thornthwaite, A. C., 1948, An approach toward a rational classification of climate: Georgia Review, v. 38, p. 55-94.

## SELECTED TAXONOMIC REFERENCES

### Polychaeta

- Day, J. H., 1967, A monograph on the Polychaeta of Southern Africa, Part I. Errantia, Part II. Sedentaria: Trustees of the British Museum (Natural History) London, pub. no. 656, 842 p.
- Day, J. H., 1973, New polychaeta from Beaufort, with a key to all species recorded from North Carolina: National Oceanic and Atmospheric Administration Technical Report NMFS Circular 375, 140 p.
- Fauchald, Kristian, 1977, The polychaete worms, definitions and keys to the orders, families and genera: Natural History Museum of Los Angeles County, Science Series 28, 188 p.
- Fauvel, Pierre, 1923, Polchètes errantes: Faune de France, 5, 486 p.
- Fauvel, Pierre, 1927, Polychètes sédentaires: Faune de France, 16, 494 p.
- Foster, N. M., 1971, Spionidae of the Gulf of Mexico and the Caribbean Sea: Studies Fauna Curacao and Other Caribbean Islands, 36, 183 p.
- Harper, Donald, Jr., Key to the polychaetous annelids of northwestern Gulf of Mexico, 70 p (unpublished).
- Hartman, Olga, 1947, Allan Hancock Pacific Expeditions: Allan Hancock Foundation, vol. 10, 535 p.
- Hartman, Olga, 1951, The littoral marine annelids of the Gulf of Mexico: Publications of the Institute of Marine Science, vol. 2 (1), 124 p.
- Hartman, Olga, 1961, Polychaetous annelids from California: Allan Hancock Pacific Expeditions: Los Angeles Calif., University of Southern California Press, 25, 226 p.
- Pettibone, Marian H., 1963, Marine polychaete worms of the New England Region Aphroditidae through Trochochaetidae: United States National Museum, Bulletin 227 (1), 356 p.

### Mollusca

- Abbott, R. T., 1974, American seashells, 2nd ed.: New York, Van Nostrand Reinhold Co., 663 p.
- Andrews, J., 1977, Shells and shores of Texas: Austin, Tex., University of Texas Press, 365 p.
- Clench, W. J., (ed.), 1941-1972, Johnsonia: Monographs of the marine mollusks of the western Atlantic, 5 volumes: Cambridge, Mass., Harvard University, Museum of Comparative Zoology.

- Moore, D. R., 1964, The family Vitrinellidae in south Florida and the Gulf of Mexico: Miami, Fla., University of Miami, Ph.D. dissertation, 235 p.
- Morris, P. A., 1975, A field guide to shells of the Atlantic and Gulf coasts and the West Indies, 3rd edition (Clench, W. J., ed.): Boston, Houghton Mifflin Co., 330 p.
- Pulley, T. E., 1952, An illustrated checklist of the marine mollusks of Texas: Texas Journal of Science, 2: p. 167-186.
- Radwin, G. E., 1977, The family Columbellidae in the western Atlantic: The Veliger, 19 (4):p. 403-417.
- \_\_\_\_\_, 1977a, The family Columbellidae in the western Atlantic. Part IIa. - The Pyreninae: The Veliger, 20 (2):p. 119-133.
- \_\_\_\_\_, 1978, The family Columbellidae in the western Atlantic. Part IIb. -The Pyreninae: The Veliger, 20 (4):p. 328-334.
- Warmke, G. L. and Abbott, R. T., 1962, Caribbean seashells: Narberth, Pa., Livingston Publishing Co., 348 p.

#### Crustacea

- Barnard, J. L., 1958, Index to the families, genera, and species of the gammaridean Amphipoda (Crustacea): Los Angeles, California, Allan Hancock Foundation, Occasional Papers, University of Southern California, 19, 148 p.
- \_\_\_\_\_, 1969, The families and genera of marine gammaridean Amphipoda: United States National Museum, Bulletin 271, 535 p.
- Bousefield, E. L., 1965, Haustoriidae of New England (Crustacea: amphipoda): Proceedings of the United States National Museum, 117, p. 159-240.
- \_\_\_\_\_, 1973, Shallow water gammaridean Amphipoda of New England: Ithaca, N.Y., Comstock Publishing Associates, 312 p.
- Calman, W. T., 1912, The Crustacea of the order Cumacea in the collection of the United States National Museum: Proceedings of the United States National Museum, 41 (1876), p. 603-676.
- Felder, D. L., 1973, An annotated key to the crabs and lobsters (Decapoda: Reptania) from coastal waters of the northwestern Gulf of Mexico: Baton Rouge, La., Center for Wetland Resources, LSU-SG-73-02, 103 p.
- McKinney, L. D., 1977, The origin and distribution of shallow water gammaridean Amphipoda in the Gulf of Mexico and Caribbean Sea with notes on their Ecology: Texas Agricultural and Mechanical University, College Station, Texas, Ph.D dissertation, 401 p.
- Menzies, R. J., and Frankenberg, D., 1966, Handbook on the common marine isopod crustaceans of Georgia: Athens, Ga., The University of Georgia Press, 93 p.

- Richardson, H., 1905, A monograph on the isopods of North America: United States National Museum, Bulletin 54, 727 p.
- Schultz, G. A., 1969, How to know the marine isopod crustaceans: Dubuque, William C. Brown Company, 359 p.
- Smith, R. J., 1964, Keys to the marine invertebrates of the Woods Hole region: Woods Hole, Mass., Systematic-Ecology Program, Marine Biological Laboratory, 208 p.
- Tattersall, W. M., 1951, A review of the Mysidacea of the United States National Museum: United States National Museum, Bulletin 201, 292 p.
- Williams, A. B., 1965, Marine decapod crustaceans of the Carolinas: Fishery Bulletin of the Fish and Wildlife Service, vol. 65 (1), 298 p.
- Wood, C. E., 1974, Key to the nantantia (Crustacea: Decapoda) of the coastal waters on the Texas coast: Contributions in Marine Science, vol. 18, p. 35-56.